Earthtech, Inc.
CONSULTING SCIENTISTS & ENGINEERS

Environmental, Mining &
Site Development Services
www.earthtechinc.net

June 9, 2025

Commonwealth of Pennsylvania
Department of Environmental Protection
Cambria District Mining Office
286 Industrial Park Road
Ebensburg, PA 15931

ATTN: Mr. Michael R. Schirato, P.G.

RE: Rockwood Stone, LLC
Rockwood Quarry
Application No. 56250301
Black Township, Somerset County

Mr. Schirato:

Enclosed please find responses to the Department's letter dated May 14, 2025 for the above referenced site. Please note, the original proof of publication is also included. Should have any questions regarding this submittal, feel free to contact our Somerset office.

Sincerely,

Ryan D. Stairs, P.G.

Attachments – 2 copies, 1 CD

cc: Public Review – Somerset County Conservation District

Mailing Address: **Somerset Office**
966 Pleasant Hill Road
Somerset, PA 15501
Email: rstairs@earthtechinc.net

Office Numbers: **Somerset, PA: (814) 266-6402**
Uniontown, PA: (724) 439-1313

Module 1

1. **The coordinates provided for the center of the permit area are incorrect. Please revise. [§77.126]**

   The coordinates have been updated for the center of the permit area.

Exhibit 6.2 — Environmental Resource Map

1. **Site visit noted a pond associated with springs 14 and 15 that is not shown on the exhibit. Please revise. [§77.410]**

   The exhibit has been revised to show the pond associated with springs 14 and 15.

2. **Site visit noted two additional springs along the power line near' spiking 20. Please label and show the springs on the exhibit and collect two background samples. [§77.410]**

   The springs are now shown and labeled on the exhibit. Background samples from these springs have been collected.

3. **Site visit noted an unnamed tributary within the central permit area. Please show the tributary on all exhibits and apply the 100-foot stream barrier since this stream was determined to be intermittent. There are also two headwater springs associated with this tributary. Please label and collect two background samples. [§77.410]**

   Please refer to the revised Exhibit 6.2 map and updated 8.1(A)'s. Also note that the Phase 1 area has been adjusted and the Phase 2 area has been removed from the bonded operational area at this time. All appropriate modules have been revised to reflect these adjustments and are included with this submission. A revision will be submitted to the department in the future to address mining in the Phase 2 area and any potential impacts and/or mitigation of this intermittent stream.

4. **Site visit noted a small wetland at the southern end of Sediment Pond 2. Please delineate this wetland and depict on all exhibits. This may necessitate revision on the location of the pond to avoid impacting the wetland. [§77.410]**

   The small wetland has been depicted on the Exhibit 6.2 Map and Pond 2 has been shifted slightly to avoid it.

Module 8

1. **Please provide two static water level measurements for background points 18 and 19. [§77.405]**

   Please refer to the Module 8.1(A) for water level readings on background point 19. Background point 18's well is located under a deck adjacent to the house and is inaccessible for a water level reading.

2. **Please provide flow measurements for background points 20, 21, and 22. [§77.406]**

   Please refer to the revised Module 8.1(A)'s. A flow measurement device (elevated pipe for volumetric readings) has been installed in the overflow channel of monitoring point 20 to allow for accurate flow measurements when the spring is overflowing. Background point 21 shows no sign of discharge and only dip samples from the spring house are able to be obtained. The overflow channel of background point 22 has been cleaned out to allow for cross-sectional flow measurement when discharging.

3. **Please identify the recharge area for 20 since it is currently used as a water supply. Also address how mining in the recharge area will not impact the quantity or quality of this spring in the response to Module 8.6 and Module 8.7. [§77.406 §77.457]**

   As previously stated in Module 8.3, 8.6, and 8.7, the aquifer feeding the spring at sample point 20 is at least 30 feet below the bottom of the Freeport Sandstone and no mining has been proposed within 550 feet horizontally of the spring itself. The current SNC operation has now affected approximately 5 acres, including significant Freeport Sandstone extraction, in the general area up-gradient of sample point 20. There have been no effects to either the quality or quantity of this spring at this time and no further impacts are anticipated since most of the future mining on the LNC will be in a direction away from the spring's recharge area.

4. **The response to Module 8.7 notes that Property 23 has an unused private well located on the property. Please confirm and show this well on the exhibits and collected two background samples. [§77.126 §77.405]**

   According to property owner interview, the well on property #38 (Mallory) has been unused for some time. It is reported to be drilled to a depth of 200 feet and apparently contains elevated levels of iron and sediment. With the pump in inoperable condition and the plumbing/wiring still installed, there is no way to obtain a sample from this well. The current water supply for this residence is reported to be from the spring at monitoring point 20.

Background point 23 was a sample taken from the Mallory home for comparison to samples obtained directly from monitoring point 20.

Exhibit 9 -Operations Map

1. **Please show the stream variance area on the exhibit. [§77.410]**

   The stream variance area for Rhoades Creek has been added to the Exhibit 9. The unnamed tributary (UNT-A) has also been added to the exhibit. Also note that the Phase 1 area has been adjusted and the Phase 2 area has been removed from the bonded operational area at this time. All appropriate modules have been revised to reflect these adjustments and are included with this submission. A revision will be submitted to the department in the future to address mining in the Phase 2 area and any potential impacts and/or mitigation of this intermittent stream.

Module 14

1. **Please provide the estimated daily maximum and average monthly withdrawal rates.**

   The estimated daily maximum and average monthly water usage rates have been provided in Module 14.1(c). Based on the relatively small size and efficiency of the proposed processing facility, it is anticipated that only 85 GPM would be needed to supplement the wash plant system. Assuming 8 hours per day and 5 days per week, this would equate to an estimated maximum daily withdrawal of 40,800 gallons and an average monthly withdrawal of 816,000 gallons. The actual pumping rate from the withdrawal facility may vary from the usage rate. However, the overall total water withdrawn is estimated to reflect the numbers above.

2. **In the response to Module 14.1(c) please include a narrative of how the stream flow will be determined in order to maintain a passthrough flow of 0.43 cfs. The response only references use of a staff gauge.**

   A narrative addressing stream flow determination for maintaining the passthrough flow of 0.43 cfs is provided in the revised response to Module 14.1(c). A survey of the cross-section and profile of the stream channel in Rhoades Creek at the withdrawal location will be performed prior to the installation of the water withdrawal equipment.

This will allow for a minimum flow depth to be calculated to allow pumping activities. A staff gauge and the pump intake will then be set at the appropriate elevation with a visual indicator to show when stream conditions allow for pumping, while maintaining the minimum passthrough flow of 0.43 cfs during pumping activities. The detailed stream cross-section and profiles, along with flow calculations, can be submitted to the Department prior to implementing water withdrawal from Rhoades Creek.

3. **Please establish a monitoring point at the proposed stream withdrawal point and collect background flow measurements.**

   Monitoring point 31 has been established on Rhoades Creek at the proposed withdrawal location and background monitoring will continue for a total of six monthly samples. It is requested that commencement of quarterly monitoring at sample point 31 occur when the water withdrawal is implemented.

Bonding

1. **The response to Module 10.2 notes that the highwall will vary in height from 50-70 feet. However, the bond calculations use a highwall height of 40 feet. Please clarify. [§77.126 §77.202]**

   The bond calculation reflects the portion of the highwall that requires blasting for reclamation. Only the upper approximately 30-40 feet of the highwall will be required to be blasted, as the lower portion will be backfilled, as can be seen on the cross sections on Bond Attachment A. Therefore, the 40-foot highwall rate is appropriate for bonding purposes.

2. **Please provide a schematic of the proposed processing plant in support of the demolition bond calculations. Currently, no proposed structures are depicted on the Operations Map. [§77.126 §77.202)**

   A schematic of the proposed processing plant has been added to Exhibit 9 to support the demolition bond calculations.

LOCALiQ
Erie Times-News | The Intelligencer
Bucks County Courier Times
The Daily American | Beaver County Times
Pocono Record | Burlington County Times

PO Box 630531 Cincinnati, OH 45263-0531

AFFIDAVIT OF PUBLICATION

Kelly Brown
Rockwood Stone LLC
143 Rubright RD
Rockwood PA 15557-6025

COMMONWEALTH OF PENNSYLVANIA, COUNTY OF SOMERSET

The Somerset Daily American is a newspaper of general circulation, published at 334 West Main Street, in the borough of Somerset, County of Somerset and State of Pennsylvania. That said newspaper was established as a daily newspaper of general circulation on the First day of July, 1929, since which date said newspaper has been published daily in the Borough of Somerset; that a copy of the printed notice, hereto attached, is exactly as the same was printed and published in the regular edition of the Daily American, published in the issue dated:

03/22/2025, 03/29/2025, 04/05/2025, 04/12/2025

Sworn to and subscribed before on 04/12/2025

Legal Clerk

Notary, State of WI, County of Brown

8-21-26

My commission expires

Publication Cost:	$1084.84	
Tax Amount:	$0.00	
Payment Cost:	$1084.84	
Order No:	11147849	# of Copies:
Customer No:	1506929	1
PO #:	Application	

THIS IS NOT AN INVOICE!

Please do not use this form for payment remittance.

NICOLE JACOBS
Notary Public
State of Wisconsin

PUBLIC NOTICE
NEW PERMIT

Pursuant to the "Surface Mining Conservation and Reclamation Act" and the "Clean Streams Law" notice is hereby given that Rockwood Stone, LLC, 1281 Rubright Road, Rockwood, PA 15557 has made application to the Pennsylvania Department of Environmental Protection (DEP) for a new noncoal surface mining permit in Black Township, Somerset County. The application includes a request for authorization to discharge under an individual NPDES permit and for a variance to conduct mining activities within 100-feet of Rhoades Creek to draw water from the creek for mining usage. The application also includes a request for a land use change from forestland to unmanaged natural habitat and a variance to reclaim the site from the approximate original contour. Additionally, the application will conduct blasting in compliance with all applicable State and Federal laws. The proposed permit is 175 acres, is southeast of Rockwood, PA, and on the eastern side of Rockdale Road (S.R. 2016). The receiving streams for this proposed permit area are Unnamed Tributaries to Rhoades Creek (WWF), Rhoades Creek (WWF) and Unnamed Tributaries to the Casselman River (WWF). The Rockwood, PA U.S. Geological Survey 7.5-minute topographic map contains the area described.
A copy of the application is available for public inspection at the Somerset County Conservation District, 6024 Glades Pike #103, Somerset, PA 15501. Written comments, objections, or a request for public hearing or informal conference may be submitted to the DEP, Cambria District Office, 286 Industrial Park Road, Ebensburg, PA 15931, within thirty (30) days from the date of the final (4th) publication of this notice and must include the person's name, address, telephone number, and a brief statement as to the nature of the comment(s).

SECTION C. (continued)

Operation/Site Location

U.S.G.S. Map Name(s) Rockwood, PA 7.5 Min Quad

Map Coordinates (center of proposed permit area)

Latitude 39° 54′ 21″ Longitude 79° 09′ 07″

Method of latitude/longitude collection: eMap

Horizontal accuracy (feet/inches) +/- 50'

Horizontal Reference Datum

- ☐ N.Am. 1927
- ☒ N.Am. 1983
- ☐ World Geodetic 1984

Name or route number of nearest state/township road and a description of the location of the road that provides access to the operation: Access is from an existing common use road (Substation Road), just east off of Rockdale Road (S,R, 2016).

Name(s) of receiving stream(s) and Chapter 93 Classification

Unnamed Tributaries to Rhoades Creek (WWF), Rhoades Creek (WWF), and Unnamed Tributaries to Casselman River (WWF)

MSHA Mine I.D. No

Extent of Mining

Mining Area

List Rock/Mineral to be Mined (Include topsoil/overburden to be sold)	Acres of Rock/Mineral Removal
Freeport Sandstone	45.2

Total surface acres to be affected by rock/mineral removal: 66.3

Total underground acres to be affected by rock/mineral removal: 0

Permit Area (total acres of mining and support): 175

Remining

Total acres of abandoned mine land (i.e., open pits, refuse/spoil piles, surface area affected by underground mining) to be re-affected. 0

Processing Facility

Total acres to be affected 10.0

Wetlands

Total acres of wetland to be affected by mining: 0

Total acres of wetland to be replaced: 0

1. Is the project located in or within a 0.5-**mile radius of an Environmental Justice community as defined by DEP?** ☐ Yes ☒ No

To determine if the project is located in or within a 0.5-mile radius of an environmental justice community, please use the online PennEnviroScreen tool. To see specific EJ areas, select the appropriate year of your submittal from the themes box on the right.

2. Have you informed the surrounding community prior to submitting the application to the Department? ☐ Yes ☒ No

Method of notification: _____

3. **Have you addressed community concerns that were identified?** ☐ Yes ☐ No ☒ N/A

If no, please briefly describe the community concerns that have been expressed and not addressed.

4. **Is your project funded by state or federal grants?** ☐ Yes ☒ No

Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.

Aspect of Project Related to Grant

Grant Source: _____

Grant Contact Person: _____

Grant Expiration Date: _____

5. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☒ Yes ☐ No

Note: If "No" to Question 5, the application is not subject to the Land Use Policy.

If "Yes" to Question 5, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants should submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☒ Yes ☐ No

2. **Is there a county stormwater management plan?** ☒ Yes ☐ No

3. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☐ Yes ☒ No

4. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☐ Yes ☒ No

Note: If the Applicant answers "No" to either Questions 1, 3 or 4, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 5 and 6 below.

If the Applicant answers "Yes" to questions 1, 3 and 4, the Applicant should respond to questions 5 and 6 below.

5. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☐ Yes ☐ No

6. **Have you attached Municipal and County Land Use Letters for the project?** ☐ Yes ☐ No

Pennsylvania Department of Environmental Protection

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

BONDING INCREMENT APPLICATION AND AUTHORIZATION TO CONDUCT NONCOAL MINING ACTIVITIES

(☒ New or ☐ Revision)

DEP Use Only
No.
Bond No.
Filing Fee
Amount
Date Received

Instructions

Submit the original of this application and one copy. The affidavit must be properly signed and executed. Include any other permit modifications under an Application – For Mining Permit Revision (5600-PM-BMP0015).

Note: No portion of the permit area shall be affected by noncoal mining activities unless the operator has provided a bond to the Department and the Department has approved the bond and issued a written authorization to affect such area.

Applicant: Rockwood Stone, LLC.
Address: 1281 Rubright Road
Rockwood, PA 15557
Telephone: 814-442-4025
Email: spencer@fearlessleasing.com

Surface Mining Permit No.: 56250301
Operation Name: Rockwood Quarry
Municipality: Black Township
County: Somerset

Name of Landowner	Municipality	County	Acres to be Affected
Joseph C. & Lynette E. Metzgar	Black Township	Somerset	63.9
On the Trail, LLC.	Black Township	Somerset	2.4
		Mining Area (Total):	66.3

Consent of Landowner Form (check applicable)

☒ The Consent of Landowner Form is attached and it has been recorded with the Recorder of Deeds.

☐ The Consent of Landowner Form was filed with Bonding Increment and Mining Authorization No. _____ and it has been recorded with the Recorder of Deeds.

☐ Not filing Consent of Landowner Form because lease was in existence prior to January 1, 1972. Operator must provide 1) a true and correct copy of the lease; 2) execute a Consent of Landowner Form as Lessee; and 3) provide a Chain of Title for the Lease. The lease, Consent of Landowner Form, and Chain of Title have been recorded with the Recorder of Deeds.

Map

Attach a copy of Exhibit 9: Operations Map indicating the proposed authorized area and any previously authorized area.

Bonding

Type of Bond: ☒ Surety ☐ Collateral ☐ PILB

Will there be a request for a phased deposit of collateral? (See 25 PA Code Ch. 77.226 for requirements)

☐ Yes ☒ No ☐ N/A

Phased deposit schedule:

Bond Amount

1. Bonding Calculations – Consolidated Noncoal

   Is the Bond Calculation Summary (5600-FM-MR0474) for consolidated Noncoal mining operations attached?

   ☒ Yes ☐ No

2. Bonding Calculations – Unconsolidated Noncoal (sand & gravel, unconsolidated shale, clay, etc.)

   Is the Bond Calculation Summary (5600-FM-MR0473) for unconsolidated noncoal mining operations attached?

   ☐ Yes ☒ No

3. Bond calculation is not applicable with this submittal.

   ☒ Date of current bond calculation: June 2025.

Application Fee

There is a fee required under 25 PA Code Chapter 77.106 for each bonding increment application. Current fees can be viewed at Fees Associated with Mining Activities. Indicate which of the following applies to this application:

☒ New permit application: fee waived

☐ Fee submitted with the application

☐ No fee included. Explain: _____

AFFIDAVIT

This section must be signed by an official and notarized.

Commonwealth of Pennsylvania, County of Somerset

I, Spencer Svonavec being duly sworn, according to law, depose that I

- ☐ am the applicant.
- ☒ am an officer or official of the applicant.
- ☐ have the authority to make this application.

and that the plans, reports, and documents submitted as part of this renewal application and its attachments are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Applicant or Responsible Official

Title Member – Rockwood Stone, LLC.

Address 1281 Rubright Road

Rockwood, PA 15557

Sworn and Subscribed to Before Me This

6th Day of June, 2025

Commonwealth of Pennsylvania - Notary Seal
Christine Marie DeMarco, Notary Public
Somerset County
My commission expires July 28, 2025
Commission number 1317443
Member, Pennsylvania Association of Notaries

Notary Signature: Christine Marie DeMarco

Noncoal Bond Rate Guidelines 2025

Project Name:	Rockwood Quarry
Operator:	Rockwood Stone, LLC.
Municipality:	Black Township
County:	Somerset

Revised 6.2025

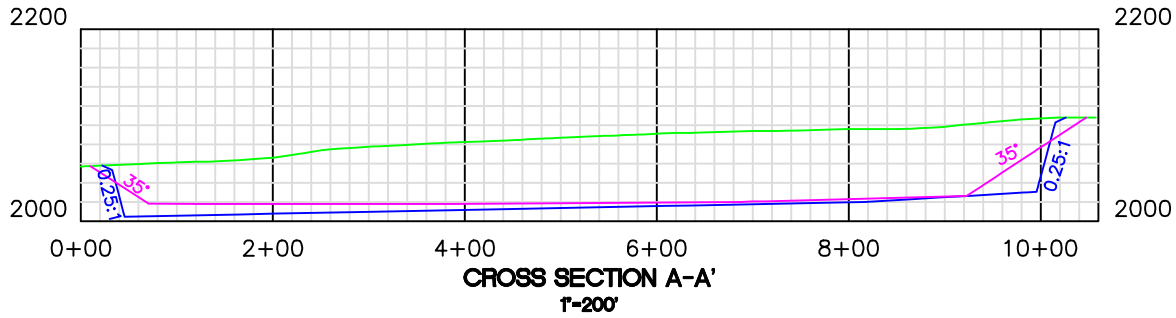
Unit Operation	Unit Measure	Unit Costs ($)	If Applies to Permit Mark with " X "	Amount of Units	Total ($)
Mining Area	acre	3,500.00	x	45.2	**158,200.00**
Support Area	acre	1,830.00	x	21.1	**38,613.00**
Grading	cubic yard	1.05	x	320,000	**336,000.00**
Highwall Blasting	linear foot	40.00	x	3,600	**144,000.00**
Pond Removal	pond	3,800.00	x	2	**7,600.00**
Structure Demolition	Costs for structure demolition will be calculated using costs listed in the construction industry's latest annual cost publications, such as the *Means Building Construction Cost Data* publication.	2025 CostWorks	x	22,469.00	**22,469.00**
				Subtotal	**706,882.00**

Special Condition	Unit Measure	Unit Costs ($)	If Applies to Permit Mark with "X"	Amount of Units	Total ($)
Mobilization/Demobilization	4% of subtotal or maximum of $40,000.00	0.04	x	706,882.00	**28,275.28**
				Subtotal	**28,276.00**

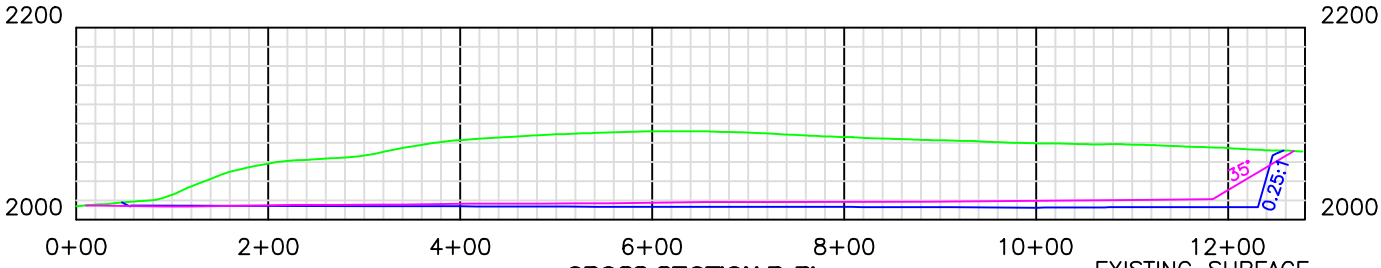
Conventional Bond Total Required **$735,158.00**

CONVENTIONAL BOND CALCULATIONS

OPERATION	**EXPLANATION FOR CALCULATIONS**
Mining Area:	45.2 acres (See bond data on Exhibit 9)
Support Area:	21.1 acres (See bond data on Exhibit 9)
Grading:	Pit to be backfilled with 320,000 CY of material; *see Bond Attachment A*
Pond:	2 ponds to be removed
Mobilization/Demobilization:	4% of direct costs or $40,000 maximum
Other:	Structure Demolition Details: **Total from below: $22,469.00**
	The 2025 edition of Means Building Construction Cost Data publication was used in order to determine the structure demolition figure:
	Conveyor Demolition: Conveyor Belt = **1,042** total feet Steel Frame Structure Demolition: *Labor Foreman* $76.53/hr @ 40 hrs = $3,061.20/wk and *Laborers (4)* $73.60/hr each @ 40 hrs = $11,776.00/wk; $3,061.20 + $11,776.00 = Total $14,837.20; *reference CSI #024116130020 crew info.* Front-End Loader: (95 h.p.) for 5 days @ $720.00/day = $3,600.00; *reference #015433204620* **Total Conveyor Cost:** $14,628.40 + $3,600.00 = **$18,228.40**
	Scale Demolition: Steel Frame Structure Demolition: 70' x 10' x 1'; $0.57/c.f. = $399.00; *reference #024116130020* Concrete Footer Ramps: 10' x 10' x 1 1/2'; $0.81/c.f. = $121.50; *reference #024116130050* **Total Scale Demolition:** $399.00 + $121.50 = **$520.50**
	Removal Costs for Mobile Items: **Total = $995.00** Scale House $995.00/item for removal off of the site; reference *#015436501400*
	Plant Demolition Items: Jaw Crusher (1), Cone Crusher/Screen (1), Screendeck (1), Sand Processing Screw (1) and other processing equipment. *reference CSI #050505100270* **Total Demolition Items:** $545.00 x 5 demolition items = **$2,725.00**

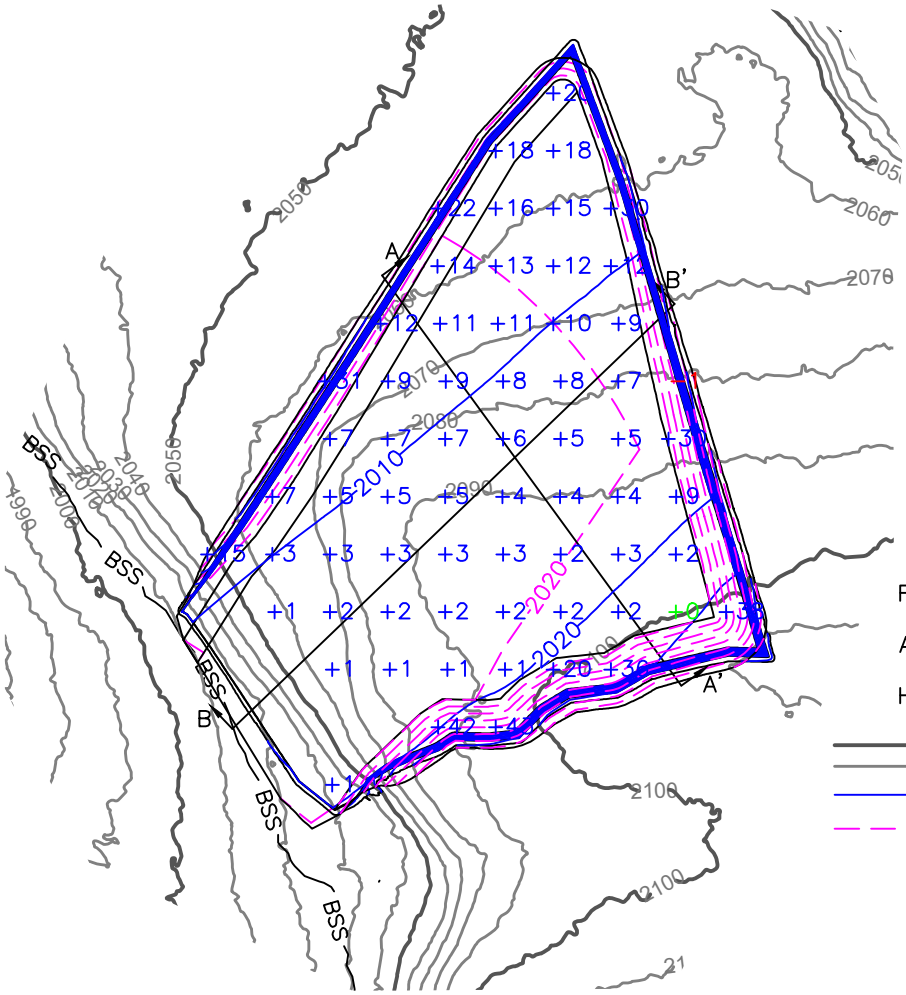


CROSS SECTION A-A'
1"=200'



CROSS SECTION B-B'
1"=200'

EXISTING SURFACE
PIT SURFACE
RECLAMATION SURFACE



BACKFILL VOLUME PER PIT

FILL VOLUME: 320,000 C.Y.

AREA IN FILL: 21.8 ACRES

HIGHWALL BLASTING LENGTH: 3,600 FEET

1700 EXISTING 10' PASDA CONTOURS

1700 PROPOSED 10' PIT CONTOURS

1700 PROPOSED FINAL RECLAMATION (NOT AOC)

LARGEST PROPOSED SANDSTONE MINING PIT

SCALE: 1" = 400'

FOR COMPLETE MINING DETAILS, SEE MODULE 10.1 & 10.2

BOND ATTACHMENT A

ROCKWOOD STONE, LLC

ROCKWOOD QUARRY

BLACK TOWNSHIP, SOMERSET COUNTY, PA

SCALE: AS NOTED 06-06-2025

Earthtech, Inc.
966 Pleasant Hill Road, Somerset, PA 15501
Telephone: (814) 266-6402
http://www.earthtechinc.net

SECTION C. OUTFALL INFORMATION

This Section is to be completed when discrete outfalls are proposed. Attach additional pages for more than 4 points.

21. Identify each point in the tables below. Each discharge point must be shown and labeled as such on a map submitted with this application or as part of the mining permit/authorization. The labeling of discharge points must correspond with the labels used on the exhibit maps submitted in support of the mining permit/authorization. Non-discharging sedimentation traps and groundwater infiltration points are not outfalls and should not be included as outfalls but should be listed at the end of this section. Emergency Spillway(s) for ponds associated with non-discharge alternative must be permitted.

Describe the location and source of each point.

Discharge Point (e.g. SP 001, SP 002 etc.)	Latitude	Longitude	Receiving Stream	Source of Discharge (e.g., sedimentation pond, groundwater sump, etc.)
001	39° 54' 22"	79° 09' 24"	Unnamed Tributary to Rhoades Creek	Sediment Pond 1 (SP-1)
002	39° 54' 14"	79° 09' 17"	Unnamed Tributary to Rhoades Creek	Sediment Pond 2 (SP-2)

For the same points as above, describe the flow and treatment for each point.

	Flow			
Discharge Point (e.g. SP 01, SP 02 etc.)	**Average rate (mgd)**	**Design rate (mgd)**	**Frequency** (Intermittent (I), Precipitation Dependent (P), Continuous (C)	**Treatment**
001	0.80	130.9	P	Retention and Settling of Solids
002	0.80	190.6	P	Retention and Settling of Solids

Design rate is the discharge flow at the Q 7-10 stream flow for post-mining discharges, the maximum hydraulic capacity for other treatment facilities or the routed storm flow for sedimentation ponds.

Latitude/Longitude Collection Method: ☒ EMAP ☐ GPS ☐ Printed Map ☐ Other _____

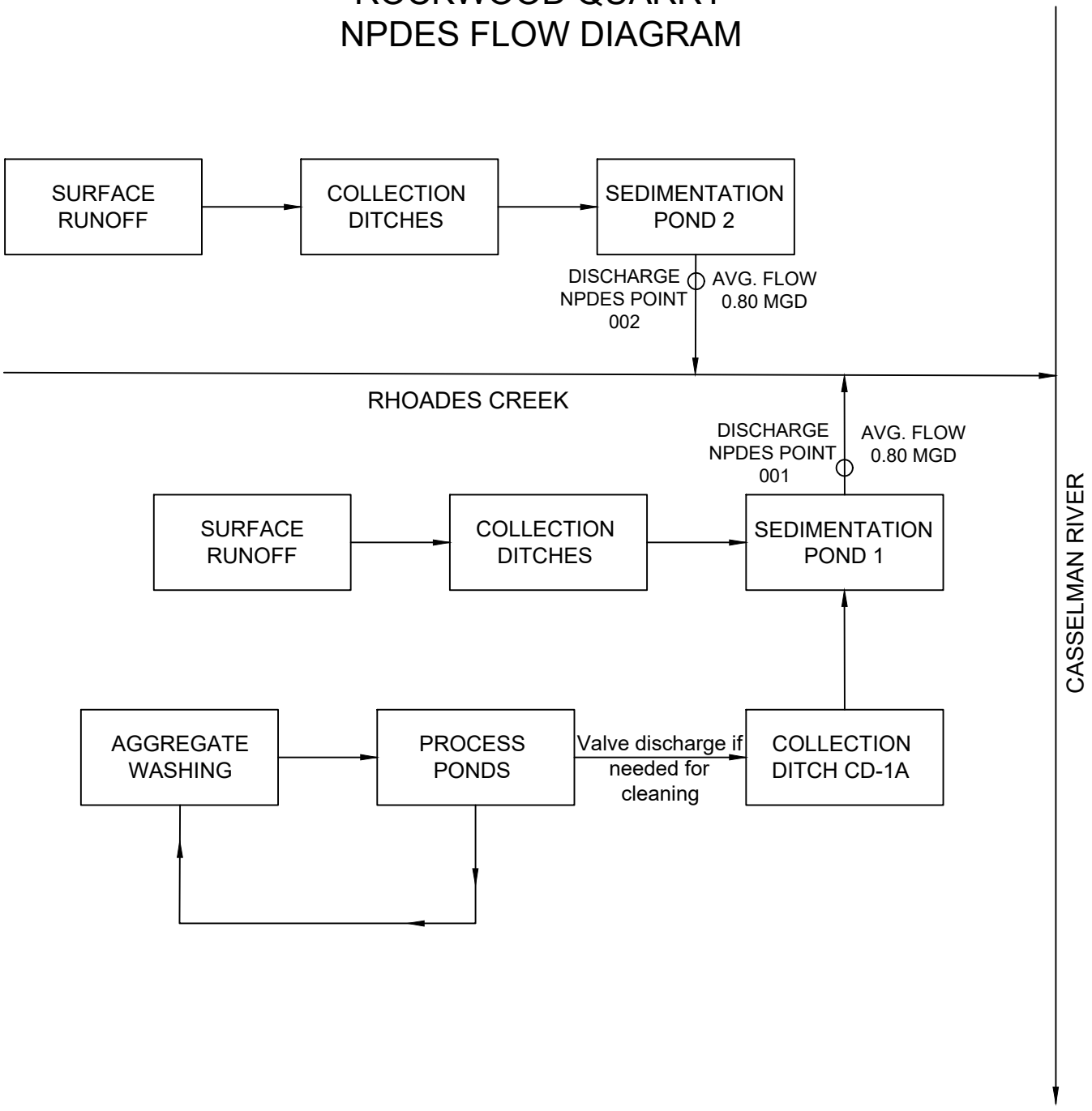
Check the horizontal reference datum (or projection datum) employed in the collection method.

☐ NAD27 (topo maps) ☒ NAD83 (Emap) ☐ WGS84 (GEO84) (most GPS units)

For non-discharging sedimentation traps and groundwater infiltration points, provide the description and location:

Discharge/Sampling Point:	Latitude:	Longitude:	Source of Discharge (e.g., sedimentation pond, groundwater sump, etc.):
Process Pond 1	39° 54' 32"	79° 09' 18"	Process Pond 1 outflow to Process Pond 2
Process Pond 2	39° 54' 29"	79° 09' 20"	Process Pond 2 outflow to Processing Plant

ROCKWOOD STONE LLC
ROCKWOOD QUARRY
NPDES FLOW DIAGRAM



5.3 Adjacent Area (continued)

(18)	Samuel Q. Sanner	Tax Map No. S06-006-052-04
(19)	Debra E. Wagner	Tax Map No. S06-016-030-00
(20)	Charles Scott Monorak & Kristeen A. Pritts	Tax Map No. S06-016-029-00
(21)	Jon J. & Kortini D. Pribelsky	Tax Map No. S06-016-028-00
(22)	Allyson Elizabeth Cramer	Tax Map No. S06-016-027-00
(23)	Sean T. Ibinson II	Tax Map No. S06-016-026-00
(24)	Neal C. & Lynette R. Adolphson	Tax Map No. S06-016-024-00
(25)	Kathy J. Putman	Tax Map No. S06-016-022-00
(26)	Brooke C. & Leeanna Baer	Tax Map No. S06-016-025-00
(27)	Lynn D. & Debra A. Sanner	Tax Map No. S06-006-046-00
(28)	Justin Trimpey & Amanda Urban	Tax Map No. S06-016-044-00
(29)	Diane L. Paul	Tax Map No. S06-016-043-00,015-00,018-00,019-00
(30)	James Edward Brant	Tax Map No. S06-016-021-00
(31)	Rebekah M. & Robert G. Deskevich	Tax Map No. S06-016-020-00
(32)	Joseph D. Ledosky	Tax Map No. S06-016-017-00
(33)	Rick L. Bruner	Tax Map No. S06-016-016-00
(34)	Robert & Tracy A. Deskevich	Tax Map No. S06-016-012-00
(35)	Kevin A. Phillippi	Tax Map No. S06-016-023-00
(36)	Anna Marie Leisher & Josiah J. Withrow	Tax Map No. S06-016-042-00
(37)	Rockwood American Legion	Tax Map No. S06-016-007-00
(38)	James & Debra A. Mallory	Tax Map No. S06-016-035-00
(39)	County of Somerset	Tax Map No. S06-005-004-00
(40), (41)	Barry L. & B. Jean Atchison	Tax Map No.S06-006-042-00
(42), (43)	Penelec c/o First Energy Service Co.	Tax Map No. S06-006-041-00
(44)	Douglas L. & Roxanne Sanner	Tax Map No. S06-006-062-00
(45)	Todd David Miller & Heather M. Weimer	Tax Map No. S06-006-076-00
(46)	B&O RR Co. c/o CSX Transportation Co. Inc.	Tax Map No. S06-006-063-00
(49)	Gail A. Snyder	Tax Map No. S06-010-004-00
(50)	Samuel Q. & Christine Sanner	Tax Map No. S06-006-057-00
(51)	Borough of Rockwood	Tax Map No. S36-012-154-00, 159-00, 160-00
(52)	*UNKNOWN*	Tax Map No. *UNAVAILABLE*
(53)	Jason L. & Kelly L. Atchison	Tax Map No. S36-012-153-00
(54)	Robert C. & Lynette Atchison	Tax Map No. S36-012-151-00
(55)	Wayne R. Davis	Tax Map No. S36-012-150-00
(56)	Charles G. Gary	Tax Map No. S36-012-149-00
(57)	Rockwood Borough	Tax Map No. S36-012-149-01

6) discharges within the permit area resulting from underground mines and discharges resulting from underground mines that are within the permit area but discharge outside the permit area.

See the Exhibit 6.2 Map for sample point locations and the corresponding Module 8.1(A) data sheets.

7) any monitoring wells developed to determine the characteristics of the groundwater. (The Department may require additional monitoring wells.)

N/A – See provided discussion in Module 8.2b)

8) private water supplies and water supplies abandoned because of degradation or pollution from mining, within the permit area and within 1000 feet of the permit area. For each water supply sampled, provide the data required on the Private Water Supply Information Exhibit 8.2(A)(8) and indicate the source of the information (e.g. owner interview, survey by operator, P.E. etc.). (Provide driller logs if available.) (The Department may require additional water supply information on a case-by-case basis.)

Inventoried private water supplies within 1000-feet are identified on the Exhibit 6.2 Map and documented on the 8.2(A)(8) chart and in section 8.7 of this module.

b) Monitoring Program

Describe the proposed surface and groundwater monitoring plan that will be conducted. The monitoring plan shall include quantity and quality measurements of discharges from the operation; points that will show any effect of the discharge on the receiving stream; and points that will show any effect on the groundwater system. Unless otherwise approved by the District Mining Office prior to permit application submittal, monitoring points must have a minimum series of six (6) complete chemical analyses collected at monthly intervals and should include the month of August, September or October to reflect low flow conditions. A minimum of six (6) monthly samples should be submitted with the application and any additional samples while the application is in process.

All monitoring points must be keyed to Exhibit 6.2. Monitoring plans must provide for collection and monitoring on a quarterly basis unless otherwise specified by the Department. All monitoring data must be compiled on Module 8.1(A) or equivalent facsimile. All monitoring points should be identified in the field with durable markers that can be maintained (wooden stakes, metal or plastic tags, etc.; not just plastic flagging).

The following monitoring program is proposed for the Rockwood site.

The following monitoring locations should be included in the monitoring program:

		Monitoring Points (Key to Exhibit 6.2)
1)	receiving streams above proposed discharge points	1, 8, 31
2)	receiving streams below proposed discharge points	9, 11
3)	abandoned underground or surface mine discharges that are hydrologically connected and may be impacted by the proposed mining	N/A
4)	representative springs and seeps within the permit area and within 1000 feet of the permit area	14, 20
5)	representative wetlands with **defined discharge points** within the permit area and wetlands within 1000 feet of the permit area that may be impacted by the proposed mining,	N/A
6)	water supplies	20 (see 8.7a)
7)	cased boreholes/piezometers	N/A

Module 8.1(A)

[ ] BACKGROUND or [X] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **20**
Latitude: 39° 54' 34" N and
Longitude: 79° 09' 22" W
Surface Elevation (MSL): 1948'

Description of Sample Point**: Spring on property (2) Joe Metzgar/On the Trail, LLC

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
8/19/2024	DIP	*	7.7	5.52	<2	27	14	<10	10	<0.05	0.02	<0.1	<5		Geochemical Testing - AS/JE
9/24/2024	DIP	*	7.3	5.56	4	33	14	<10	10	<0.05	0.02	<0.1	<5		Geochemical Testing - AS/JE
10/30/2024	DIP	*	6.7	5.57	<2	29	12	<10	8	<0.05	0.02	<0.1	<5		Geochemical Testing - JE
11/25/2024	DIP	*	6.4	5.24	<2	27	10	<10	11	<0.05	0.02	<0.1	6.0		Geochemical Testing - JE
12/26/2024	DIP	*	5.7	5.50	<5	25	10	<10	14	<0.05	0.02	<0.1	<5		Geochemical Testing - JE
1/15/2025	DIP	*		5.37	<2	24	3	<10	13	<0.05	0.03	<0.1	<5		Geochemical Testing - AS
5/20/2025	VC	38.5													Flow Only - AS
6/2/2025	VC	40.5													Flow Only - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

* Dip sample obtained due to no overflow from spring. Dip sample was taken from the springhouse.

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **21**
Latitude: 39° 54' 33" N and
Longitude: 79° 09' 22" W
Surface Elevation (MSL): 1953'

Description of Sample Point**: Spring house on Joe Metzgar's property

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
8/19/2024	DIP	*	7.2	5.33	<2	26	13	<10	10	<0.05	0.02	<0.1	<5		Geochemical Testing - AS/JE
9/24/2024	DIP	*	6.7	5.49	<2	27	14	<10	8	<0.05	0.01	<0.1	<5		Geochemical Testing - AS/JE
5/20/2025	No Discharge														Flow Only - AS
6/2/2025	No Discharge														Flow Only - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

* Dip sample obtained due to no overflow from spring. Dip sample was taken from the springhouse.

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **22**
Latitude: 39° 54' 32" N and
Longitude: 79° 09' 24" W
Surface Elevation (MSL): 1944'

Description of Sample Point**: Spring house on Pavlosky property

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
8/19/2024	DIP	*	7.4	6.54	<2	42	15	13	4	0.33	0.05	<0.1	<25		Geochemical Testing - AS/JE
9/24/2024	DIP	*	6.9	6.85	2	42	16	15	1	1.03	0.09	0.1	11		Geochemical Testing - AS/JE
5/20/2025	XS	16													Flow Only - AS
6/2/2025	XS	10													Flow Only - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

* Dip sample obtained due to no overflow from spring. Dip sample was taken from the springhouse.

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

5600-PM-BMP0315-8 Rev. 1/2014

Module 8.1(A)

[X] **BACKGROUND or** [ ] **MONITORING REPORT***

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **25**
Latitude: 39° 54' 36" N and
Longitude: 79° 09' 25" W
Surface Elevation (MSL): 1936'

Description of Sample Point**: 1" black plastic pipe

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
5/13/2025	VC	1.6		5.98	<5	34	11	<10	9	<0.05	<0.01	<0.1	6		Geochemical Testing - AS
6/2/2025	VC	1.8	7.9				10								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

5600-PM-BMP0315-8 Rev. 1/2014

Module 8.1(A)

[X] **BACKGROUND or** [ ] **MONITORING REPORT***

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **26**
Latitude: 39° 54' 35" N and
Longitude: 79° 09' 21" W
Surface Elevation (MSL): 1965'

Description of Sample Point**: Spring on powerline

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
5/13/2025	XS	12		4.96	<5	98	10	<10	13	<0.05	0.22	0.2	<5		Geochemical Testing - AS
6/2/2025	XS	14	7.4				11								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

5600-PM-BMP0315-8 Rev. 1/2014

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **27**
Latitude: 39° 54' 35" N and
Longitude: 79° 09' 21" W
Surface Elevation (MSL): 1966'

Description of Sample Point**: Spring on powerline

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
5/13/2025	XS	23		5.12	<5	86	10	<10	15	<0.05	0.20	0.2	6		Geochemical Testing - AS
6/2/2025	XS	23	7.2				9								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **28**
Latitude: 39° 54' 34" N and
Longitude: 79° 09' 21" W
Surface Elevation (MSL): 1962'

Description of Sample Point**: Spring off edge of powerline

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
5/13/2025	XS	16		4.85	<5	52	9	<10	13	<0.05	0.06	0.1	<5		Geochemical Testing - AS
6/2/2025	XS	13	7.0				11								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **29**
Latitude: 39° 54' 12" N and
Longitude: 79° 08' 55" W
Surface Elevation (MSL): 2115'

Description of Sample Point**: Upstream of spring to Unnamed Tributary

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/10/2024		DRY													
8/19/2024		DRY													
9/24/2024		DRY													
10/30/2024		DRY													
11/25/2024		DRY													
12/26/2024		DRY													
5/13/2025	XS	47		4.92	<5	21	10	<10	13	<0.05	0.06	0.2	<5		Geochemical Testing - AS
6/2/2025	XS	54	6.9				10								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **30**
Latitude: 39° 54' 14" N and
Longitude: 79° 09' 03" W
Surface Elevation (MSL): 2100'

Description of Sample Point**: Spring to Unnamed Tributary to Rhoades Creek

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/10/2024		DRY													
8/19/2024		DRY													
9/24/2024		DRY													
10/30/2024		DRY													
11/25/2024		DRY													
12/26/2024		DRY													
5/13/2025	XS	310		4.93	<5	22	9	<10	13	<0.05	0.06	0.2	5		Geochemical Testing - AS
6/2/2025	XS	306	7.6				9								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[ ] BACKGROUND or [X] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **31**
Latitude: 39° 54' 16" N and
Longitude: 79° 09' 22" W
Surface Elevation (MSL): 1964'

Description of Sample Point**: Water withdrawl point from Rhoades Creek

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
5/20/2025	Est.	TLTG	8.0	7.08	5	69	11	11	4	0.25	0.03	0.1	13		Geochemical Testing - AS
6/2/2025	Est.	TLTG	7.4				10								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 8.1(A)

[X] BACKGROUND or [ ] MONITORING REPORT*

(check appropriate block)

Operator: **Rockwood Stone, LLC**
Operation Name: **Rockwood Quarry**
Permit No: **56250301**
Township: **Black**
County: **Somerset**

Monitoring Point I.D.: **32**
Latitude: 39° 54' 31" N and
Longitude: 79° 09' 23" W
Surface Elevation (MSL): 1954'

Description of Sample Point**: Spring behind Pavolsky Property

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measure-ment	Flow (GPM) or Static Water Elevation	Field pH	Lab pH	Suspended Solids mg/l	Specific Conductance (micromhos/cm) @ 25° C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Total Dissolved Solids (mg/l)	Laboratory and Name of Sampler
								Submit above as requested by the Department							
5/20/2025	VC	2.2	7.7	5.60	<5	25	8	<10	8	<0.05	<0.01	<0.1	<5		Geochemical Testing - AS
6/2/2025	VC	1.4	7.1				10								Geochemical Testing - AS

Signature of Permittee or Responsible Official or Authorized Representative

Date

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

Sampled by Earthtech, Inc.:
AS - Austin Smay
JE - Joel Emert

Abbreviation/Acronym Key:
TLTG = Too Large to Gauge
XS = Cross Section
VC = Volumetric Container
EST = Estimate

Module 10: Operational Information [§§77.452/77.456/77.563/77.564]

10.1 Equipment and Operation Plan

For each phase of mining, identify the type and method of mining; engineering techniques; major equipment to be used; starting point; and the anticipated sequence in which the phases are to be mined.

There will be three phases of mining as shown on the Exhibit 9 Operations Map. Phase 1 is proposed to be bonded and activated for mining upon permit issuance. Phases 2 and 3 will be activated at a future date with bonding calculation update and permit revision provided at that time.

Phase 1 will contain the processing plant/pad and initial mineral extraction operations. Phase 1 includes all of the proposed disturbance to the west of the First Energy High Point-Rockwood 115kV transmission line and part of the area to the east of the High Point-Rockwood transmission line. The drainage divide to Unnamed Tributary A to Rhoades Creek (UNT-A) will serve as the boundary for Phase 1. Mineral extraction may take place in any area within the bonded operational/mining area in Phase 1. Sediment pond SP-1 and associated ditches will be constructed prior to any earth disturbance in Phase 1.

Phase 2 consists of the remaining area to the east of the High Point-Rockwood transmission line, but west of the Lick Run-Rockwood transmission line. The only exception to this is that diversion ditch DD-2 will be constructed in Phase 2, which is to the east of the Lick Run-Rockwood transmission line. DD-2 is necessary in Phase 2 to limit the drainage area to SP-2. Before Phase 2 is activated, a bonding calculation update and permit revision will be necessary to accommodate for the potential stream impacts/mitigation to UNT-A. Sediment pond SP-2 and associated ditches will be constructed prior to any earth disturbance in Phase 2.

Phase 3 will include the remaining area to the east of the Lick Run-Rockwood transmission line. Before Phase 3 is activated, a bonding calculation update and permit revision will be necessary. Collection ditch CD-1B will be installed in Phase 3 to convey runoff to SP-1.

The type of mining proposed will be a surface mining block cut method. An existing small non-coal permit is active in the northern section of the proposed mining area in Phase 1. The small non-coal permit will be voided and bonds returned upon issuance and successful bonding of this LNC. Equipment utilized will be excavators, dozers, haul trucks, wheel loaders, and other typical surface mining equipment. A crushing plant will be utilized to reduce shot rock material into common aggregate sizes for sale to public markets. The first cut location for each proposed mining phase is shown on the Exhibit 9 Map. Topsoil and any other overburden will be stripped and stockpiled to be used during reclamation.

10.2 Pit Configuration

a) Identify the maximum depth of mining and the elevation of the pit floor at the maximum depth of mining for each mining phase.

The mining thickness will follow the sandstone thickness and may vary from 50’ to 70’. The sandstone dips gently to the northwest and outcrops on three sides of the property. Electric utility lines bisect the site and prevent full seam extraction in certain areas. The pit floor will be elevated considering adjoining streams and the approximate lowest elevation will be 1990’ in Phase 1.

b) If mining consolidated rock, identify the maximum highwall height and the benching interval to include the distance between the benches measured vertically (i.e. height of the working face of the bench) and the width of the benches.

The sandstone is consolidated and the maximum highwall height is approximately 70’. Typical mining will extract full column in one highwall with adequate layback. This may average 65’ or less and can be safely completed due to the competent rock unit and lack of overlying overburden.

c) If mining consolidated rock and the reclamation plan is an alternative to approximate original contour involving restoration of the pit floor and final working face, identify the total acreage of pit floor and final graded slopes.

The reclamation plan will be an alternative to approximate original contour due to leaving material in place in the area of the existing electric lines. To reclaim the site, the highwalls will be blasted or backfilled and sloped at no greater than 35° down to the pit floor. The pit floor will be backfilled only in areas where it is necessary to establish positive drainage. The total acreage of pit floor and final graded slopes will be 45.2 acres for Phase 1.

Module 12: Erosion and Sedimentation Controls
[§§77.458/77.461/77.466/77.525/77.527/77.531/Chapter 102]

12.1 Diversion Controls

Provide a plan for the collection and conveyance to a natural drainageway of the runoff from upslope undisturbed areas. Provide a separate general design for a temporary highwall diversion which limits the amount of runoff which can enter the pit (where applicable). Include design criteria, capacity calculations, profile of proposed channel slopes, typical cross-sections, required channel linings and applicable details on 12.1 Data Sheet.

During Phase 1, no diversion controls will be necessary since there will be very minimal upstream drainage area. During Phase 2, diversion ditches DD-1 and DD-2 will be installed to minimize the drainage area to SP-2. DD-1 will discharge via an energy dissipator to Rhoades Creek. DD-2 will discharge via an energy dissipator towards the Casselman River. All design criteria, calculations, and details are attached. See Exhibit 9 for the locations of the proposed diversion ditches.

A safety berm will be continuously maintained above all highwalls. These safety berms will also act as a diversion to limit the amount of runoff that can enter the pit.

12.2 Erosion and Sediment Control

Provide a plan for the control of erosion and sedimentation for lands within the permit area to be disturbed by mining activities. Include a narrative describing the implementation of the plan, and detailed design and construction plans and specifications for structures or facilities used in the plan. The plan must include each phase or phases of mining. Include design criteria, capacity calculations, profile of proposed channel slopes, typical cross-sections, required channel linings and applicable details on 12.1 Diversion/Collection Ditch Data Sheet for collection and interceptor ditches. Provide documentation of the capacity of the existing drainage system and the effect proposed mining activities will have on the drainage. Show discharge points to natural drainageways and culverts that intercept upslope drainage or carry drainage away from the site. Show facilities to scale on Modules 9 and 16 as appropriate.

See Exhibit 9 for locations of all erosion and sedimentation controls.

Before Phase 1 mining operations commence, sediment pond SP-1 will be constructed. Collection ditches CD-1A, CD-2A, and CD-2B and Culvert CULV-1 will be constructed to convey runoff into SP-1 after SP-1 is functional. Sediment pond SP-1 will control all runoff from the process pad and mining area. SP-1 will control all runoff from Phase 1 at this time, except for the haul road and support area below CD-1A. Sediment traps ST-1 and ST-2 will be installed to control runoff in this area below CD-1A. Collection ditches CD-4 and CD-5 will be installed to convey runoff to sediment traps ST-1 and ST-2, respectively. Culvert CULV-2 will be installed where CD-5 crosses the existing common use road.

Before future Phase 2 mining operations commence, sediment pond SP-2 must be constructed. After SP-2 becomes functional, CD-2B should be directed into SP-2, as shown on Exhibit 13 - Sheet 2. Collection ditch CD-3 will also be installed at this time to convey runoff to SP-2. DD-2 and DD-3 will be constructed at this time. SP-2 will control runoff from all of Phase 2 and the portion of Phase 1 to the east of the First Energy High Point-Rockwood 115 kV transmission line at this time. SP-1 will continue to control the portion of Phase 1 to the west of the above-mentioned transmission line.

Before future Phase 3 mining operations commence, collection ditch CD-1B will be constructed to convey runoff from this area to SP-1. SP-1 and SP-2 will each control runoff from a portion of Phase 3.

All ditches may be constructed as mining progresses, as long as all sediment-laden runoff gets collected and conveyed to the sediment ponds.

Calculations for all erosion and sedimentation controls are attached. All ditches were designed to convey the 10-year, 24-hour storm event and contain a proper lining. Grass-lined ditches will have R-4 rip-rap placed at any abrupt changes in ditch direction. All culverts will be designed to convey the design flow of the ditch(es) that flow to them, or the 10-year, 24-hour storm event. Rip-rap aprons or channels will provide outlet protection for all culverts. All sediment ponds have been designed to have a storage capacity of a minimum of 7,000 cubic feet per acre (2,000 c.f./acre sediment storage and 5,000 c.f./acre dewatering zone).

Alternate E&S controls consisting of compost filter sock will be utilized downgrade of all proposed ponds before any earth disturbance occurs. Compost filter socks will only receive sediment-laden runoff during the construction or reclamation of the ponds. During the time when the ponds are functional and stabilized, there is no need for alternate E&S controls. All compost filter socks were designed in accordance with Chapter 102 requirements.

12.3 Haul Roads

Provide the following information for each haul road to be constructed, reconstructed or used in the operation:

Note: Activities proposed to be conducted under General permit for Temporary Road Crossings (BMR-GP-101) and General Permit for Access Road Crossings (BMR-GP-102) must include a completed Notification Form, with attachments, for the respective General Permit (i.e., Form 5600-FM-MR0054 for BMR-GP-101 and Form 5600-FM-MR0059 for BMR-GP-102). BMR-GP-102 may not be used for haul roads.

a) Location; show on Exhibit 9 (and Exhibit 18 if road will remain as part of postmining land use);
Please see Exhibit 9 for the location of the haul road and Exhibit 18 for the location of the haul road to remain.

b) Description and typical cross-sections showing the construction of the haul road including existing ground, grades, slopes, culvert locations, outlet protection and other drainage control;
The proposed haul road will connect the proposed processing pad to the common use road and mining area. The travelway width wlll be 30' from the processing pad to the common use road and 50' from the processing pad to the mining area. The haul road will not have a slope exceeding 15% and will have a 1-2% cross slope for drainage. A safety berm will be installed along all edges where vehicle overturnment is possible. A culvert will be installed at the location(s) where a collection ditch crosses the haul road.

c) Measures to control and prevent erosion and sedimentation; include proposed spacing of sediment traps, turnouts, culverts, check dams, etc.;
Collection ditches will be installed to collect runoff from the haul roads and convey it to either SP-1 or SP-2. The haul road will be topped with a non-acid producing stone to prevent soils and other material from accumulating on the public roadway. The portion of the haul road that is downgrade of CD-1A will be controlled by sediment traps ST-1 and ST-2. Collection ditches CD-4 and CD-5 will be installed to convey runoff to sediment traps ST-1 and ST-2, respectively. Culvert CULV-2 will be installed where CD-5 crosses the common use road. The haul road will have a cross slope towards either CD-4 or CD-5, or will be crowned and sloped towards both ditches.

d) Plan for reclamation after mining is completed;
N/A - The haul road is proposed to remain after mining is completed.

e) If the haul road involves the crossing of any intermittent or perennial stream or wetland include Module 14 Streams/Wetlands;
N/A - The haul road does not cross any intermittent or perennial streams or wetlands.

f) Will a PennDOT highway occupancy permit be needed? ☐ Yes ☒ No

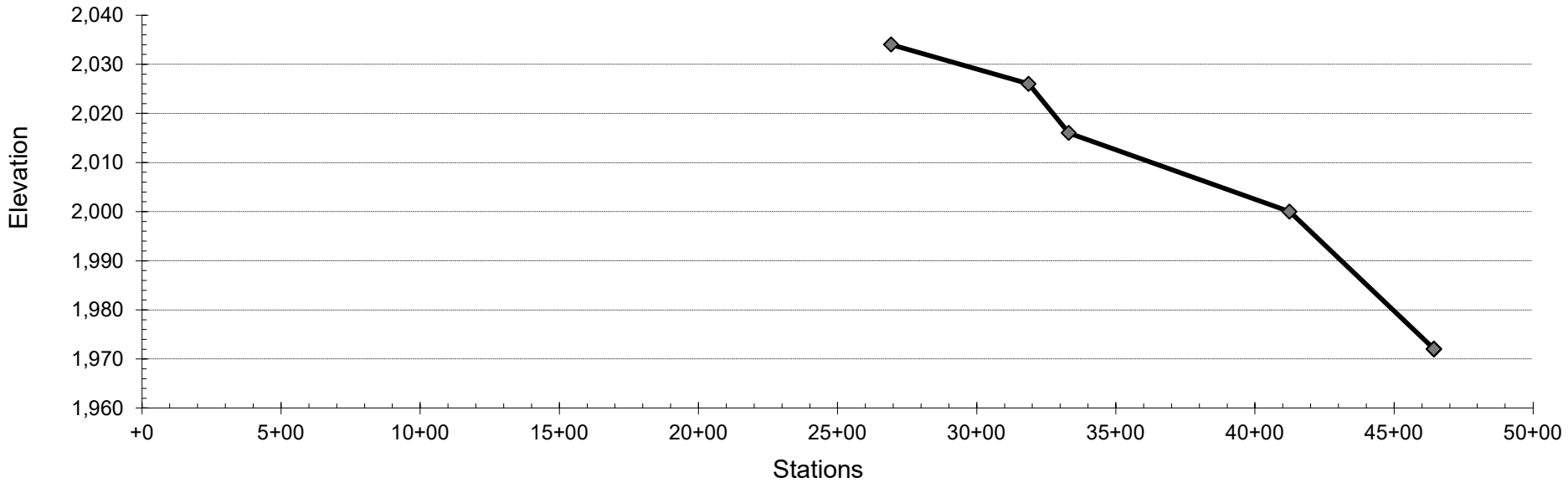
If yes, PennDOT Occupancy Permit number must be submitted prior to permit activation.

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
COLLECTION DITCH CD-1A	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station			Drainage Area (acres)					Peak Discharge Q (CFS)												With Freeboard		
Start / End	Elevation		Section	Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Section	Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	Channel Depth (ft)	Top Channel Width (ft)	Q Available (CFS)
26 + 93	2034.0																					
31 + 87	2026.0	2.8	2.8	10	6.0%	85	5.1	50.5	1.6%	0.4	R-3	0.035	5.0	2 : 1	10.9	1.40	10.6	5.28	57.7	1.75	12.0	88.6
33 + 31	2016.0	0.4	3.2	10	6.0%	85	0.7	51.2	6.9%	0.5	R-4	0.047	5.0	2 : 1	7.9	1.10	9.4	7.09	56.2	1.60	11.4	113.9
41 + 25	2000.0	11.8	15.0	10	6.0%	85	19.0	70.2	2.0%	0.5	R-3	0.035	5.0	2 : 1	12.0	1.50	11.0	6.18	74.1	2.00	13.0	129.7
46 + 44	1972.0	7.0	22.0	10	6.0%	85	10.7	80.9	5.4%	0.5	R-4	0.045	5.0	2 : 1	10.9	1.40	10.6	7.56	82.6	1.90	12.6	149.0

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-1A**				**Peak Disch & Base Flow:**	**5.1**	**45.4**
Section Number:	**1**				**Peak Discharge (Cum):**	**50.5**	
End Station:	**31**	**+**	**87**		**Drainage Acreage:**	**2.8**	
End Elevation:	**2,026.0**				**Watershed Slope:**	**6.0%**	

Given:			
Flow Depth, d (ft)	=	1.4	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.035	
Channel Slope, s (ft/ft)	=	1.62%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	57.68	cfs	
Q =	88.59	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	5.28	fps	
V_{MAX} =	6.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	1.41	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	10.92	sq.ft.	
A =	14.88	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	11.26	feet	
P =	12.83	feet	WITH FREEBOARD

$r = A/P$

r =	0.97	feet	
r =	1.16	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	10.60	feet	
T =	12.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-1A**				**Peak Disch & Base Flow:**	**0.7**	
Section Number:	**2**				**Peak Discharge (Cum):**	**51.2**	
End Station:	**33**	**+**	**31**		**Drainage Acreage:**	**0.4**	
End Elevation:	**2,016.0**				**Watershed Slope:**	**6.0%**	

Given:				
Flow Depth, d (ft)	=	1.1		
Bottom Width (ft)	=	5		
Side Slopes (H:1)	=	2		
What size Rip Rap	=	R-4		
d_{50} size (inches)	=	6		
Mannings Coefficient	=	0.047		
Channel Slope, s (ft/ft)	=	6.94%		

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	56.17	cfs	
Q =	113.88	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	7.09	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	4.77	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	7.92	sq.ft.	
A =	13.12	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	9.92	feet	
P =	12.16	feet	WITH FREEBOARD

$r = A/P$

r =	0.80	feet	
r =	1.08	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	9.40	feet	
T =	11.40	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-1A**				**Peak Disch & Base Flow:**	**19.0**	
Section Number:	**3**				**Peak Discharge (Cum):**	**70.2**	
End Station:	**41**	**+**	**25**		**Drainage Acreage:**	**11.8**	
End Elevation:	**2,000.0**				**Watershed Slope:**	**6.0%**	

Given:			
Flow Depth, d (ft)	=	1.5	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.035	
Channel Slope, s (ft/ft)	=	2.02%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	74.10	cfs	
Q =	129.73	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	6.18	fps	
V_{MAX} =	6.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	1.89	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	12.00	sq.ft.	
A =	18.00	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	11.71	feet	
P =	13.94	feet	WITH FREEBOARD

$r = A/P$

r =	1.02	feet	
r =	1.29	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	11.00	feet	
T =	13.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-1A**				**Peak Disch & Base Flow:**	**10.7**	
Section Number:	**4**				**Peak Discharge (Cum):**	**80.9**	
End Station:	**46**	**+**	**44**		**Drainage Acreage:**	**7.0**	
End Elevation:	**1,972.0**				**Watershed Slope:**	**6.0%**	

Given:			
Flow Depth, d (ft)	=	1.4	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.045	
Channel Slope, s (ft/ft)	=	5.39%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	82.59	cfs
Q =	149.00	cfs WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	7.56	fps
V_{MAX} =	9.00	fps

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	4.71	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	10.92	sq.ft.	
A =	16.72	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	11.26	feet	
P =	13.50	feet	WITH FREEBOARD

$r = A/P$

r =	0.97	feet	
r =	1.24	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	10.60	feet	
T =	12.60	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Tue May 27 15:41:40 2025

Project: ROCKWOOD By: CGY Date: 05/27/25

Location: CD-1A(3) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 11.8000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 34.20 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 495.181

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 18.967

Time of Concentration (SCS) Tue May 27 15:38:33 2025

Project: ROCKWOOD By: CGY Date: 05/27/25
Location: CD-1A(3) Checked: Date: 05/27/25
Developed

Curve Number : 85
Length of Flow : 4125.00 ft
Average Land Slope : 6.00 %

Time of Concentration : 0.570 hrs, 34.2 mins

Graphical Peak Discharge Mon Jan 20 11:03:01 2025

Project: ROCKWOOD By: CGY Date: 01/20/25

Location: CD-1A(4) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 7.0000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 37.30 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 471.368

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 10.711

Time of Concentration (SCS) Mon Jan 20 10:45:13 2025

Project: ROCKWOOD By: CGY Date: 01/20/25
Location: CD-1A(4) Checked: Date: 01/20/25
Developed

Curve Number : 85
Length of Flow : 4604.00 ft
Average Land Slope : 6.00 %

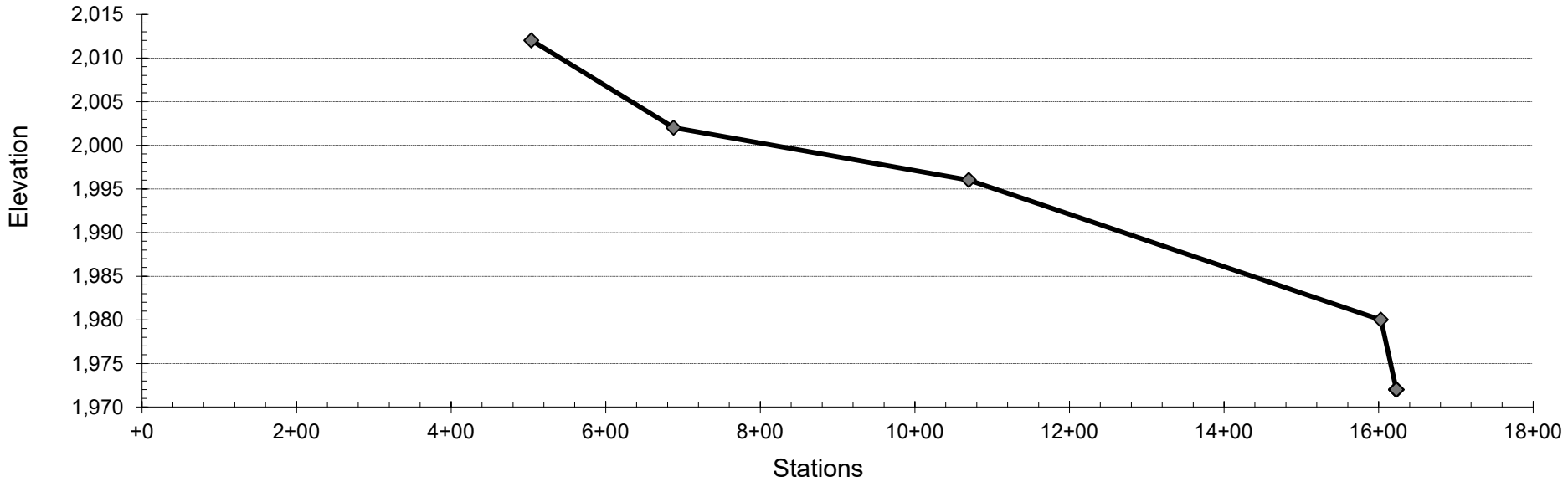
Time of Concentration : 0.622 hrs, 37.3 mins

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
COLLECTION DITCH CD-2A	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station Start	Station End	Elevation	Drainage Area (acres) Section	Drainage Area (acres) Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q (CFS) Section	Peak Discharge Q (CFS) Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	With Freeboard: Channel Depth (ft)	With Freeboard: Top Channel Width (ft)	With Freeboard: Q Available (CFS)
5 + 04		2012.0																					
6 + 88		2002.0	0.5	0.5	10	9.0%	85	1.3	82.5	5.4%	0.4	R-4	0.044	5.0	2 : 1	12.0	1.50	11.0	8.00	96.0	1.88	12.5	148.0
10 + 70		1996.0	2.6	3.1	10	9.0%	85	6.2	88.7	1.6%	0.5	R-3	0.034	5.0	2 : 1	15.5	1.80	12.2	6.16	95.3	2.30	14.2	155.1
16 + 03		1980.0	7.5	10.6	10	9.0%	85	16.4	105.1	3.0%	0.5	R-4	0.042	5.0	2 : 1	15.5	1.80	12.2	6.81	105.4	2.30	14.2	171.6
16 + 23		1972.0	0.0	10.6	10	9.0%	85	0.0	105.1	40.0%	0.5	R-6	0.071	8.0	2 : 1	10.0	1.00	12.0	11.35	113.5	1.50	14.0	234.5

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-2A**				**Peak Disch & Base Flow:**	**1.3**	**81.2**
Section Number:	**1**				**Peak Discharge (Cum):**	**82.5**	
End Station:	**6**	**+**	**88**		**Drainage Acreage:**	**0.5**	
End Elevation:	**2,002.0**				**Watershed Slope:**	**9.0%**	

Given:			
Flow Depth, d (ft)	=	1.5	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.044	
Channel Slope, s (ft/ft)	=	5.43%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	96.01	cfs	
Q =	147.98	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	8.00	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	5.09	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	12.00	sq.ft.	
A =	16.41	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	11.71	feet	
P =	13.39	feet	WITH FREEBOARD

$r = A/P$

r =	1.02	feet	
r =	1.23	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	11.00	feet	
T =	12.50	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-2A**				**Peak Disch & Base Flow:**	**6.2**	
Section Number:	**2**				**Peak Discharge (Cum):**	**88.7**	
End Station:	**10**	**+**	**70**		**Drainage Acreage:**	**2.6**	
End Elevation:	**1,996.0**				**Watershed Slope:**	**9.0%**	

Given:			
Flow Depth, d (ft)	=	1.8	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.034	
Channel Slope, s (ft/ft)	=	1.57%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	95.30	cfs	
Q =	155.11	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	6.16	fps	
V_{MAX} =	6.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	1.76	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	15.48	sq.ft.	
A =	22.08	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	13.05	feet	
P =	15.29	feet	WITH FREEBOARD

$r = A/P$

r =	1.19	feet	
r =	1.44	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	12.20	feet	
T =	14.20	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-2A**				**Peak Disch & Base Flow:**	**16.4**	
Section Number:	**3**				**Peak Discharge (Cum):**	**105.1**	
End Station:	**16**	**+**	**03**		**Drainage Acreage:**	**7.5**	
End Elevation:	**1,980.0**				**Watershed Slope:**	**9.0%**	

Given:			
Flow Depth, d (ft)	=	1.8	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.042	
Channel Slope, s (ft/ft)	=	3.00%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	105.41	cfs	
Q =	171.56	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	6.81	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	3.37	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	15.48	sq.ft.	
A =	22.08	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	13.05	feet	
P =	15.29	feet	WITH FREEBOARD

$r = A/P$

r =	1.19	feet	
r =	1.44	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	12.20	feet	
T =	14.20	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-2A**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**4**				**Peak Discharge (Cum):**	**105.1**	
End Station:	**16**	**+**	**23**		**Drainage Acreage:**	**0.0**	
End Elevation:	**1,972.0**				**Watershed Slope:**	**9.0%**	

Given:				
Flow Depth, d (ft)	=	1		
Bottom Width (ft)	=	8		
Side Slopes (H:1)	=	2		
What size Rip Rap	=	R-6		
d_{50} size (inches)	=	12		
Mannings Coefficient	=	0.071		
Channel Slope, s (ft/ft)	=	40.00%		

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	113.47	cfs	
Q =	234.48	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	11.35	fps	
V_{MAX} =	13.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 36

$A_{void}=0.4*b*t$

A_{void} = 9.60 sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = 0.40 sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = 0.05 ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	4.00	psf
Calculated Shear Stress =	1.23	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	10.00	sq.ft.	
A =	16.50	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	12.47	feet	
P =	14.71	feet	WITH FREEBOARD

$r = A/P$

r =	0.80	feet	
r =	1.12	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	12.00	feet	
T =	14.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**GREATER THAN 10% SLOPE**
SHEAR STRESS CHECK =	**PASS**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Wed May 28 12:01:44 2025

Project: ROCKWOOD By: CGY Date: 05/28/25

Location: CD-2A(1) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 0.5000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 12.80 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 781.378

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 1.268

Time of Concentration (SCS) Wed May 28 11:50:52 2025

Project: ROCKWOOD By: CGY Date: 05/28/25
Location: CD-2A(1) Checked: Date: 05/28/25
Developed

Curve Number : 85
Length of Flow : 1563.00 ft
Average Land Slope : 9.00 %

Time of Concentration : 0.214 hrs, 12.8 mins

Graphical Peak Discharge Wed May 28 12:02:15 2025

Project: ROCKWOOD By: CGY Date: 05/28/25

Location: CD-2A(2) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 2.6000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 15.30 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 729.901

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 6.160

Time of Concentration (SCS) Wed May 28 11:51:21 2025

Project: ROCKWOOD By: CGY Date: 05/28/25
Location: CD-2A(2) Checked: Date: 05/28/25
Developed

Curve Number : 85
Length of Flow : 1945.00 ft
Average Land Slope : 9.00 %

Time of Concentration : 0.255 hrs, 15.3 mins

Graphical Peak Discharge Wed May 28 12:03:05 2025

Project: ROCKWOOD By: CGY Date: 05/28/25

Location: CD-2A(3) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 7.5000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 18.60 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 673.546

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 16.398

Time of Concentration (SCS) Wed May 28 11:51:58 2025

Project: ROCKWOOD By: CGY Date: 05/28/25
Location: CD-2A(3) Checked: Date: 05/28/25
Developed

Curve Number : 85
Length of Flow : 2478.00 ft
Average Land Slope : 9.00 %

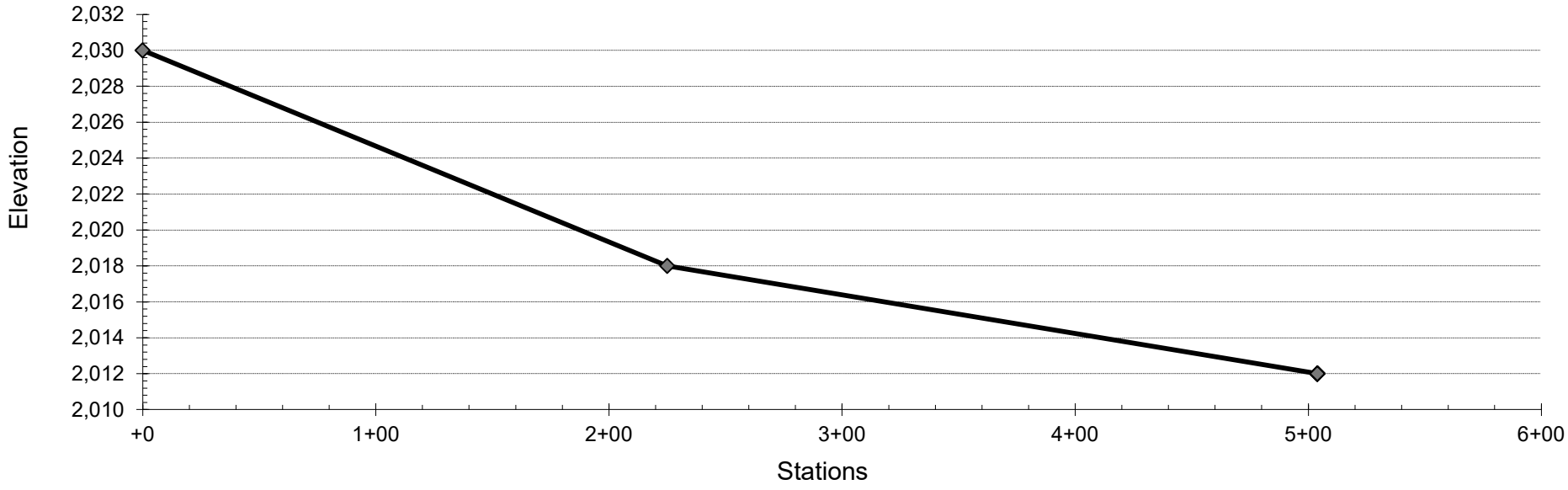
Time of Concentration : 0.309 hrs, 18.6 mins

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
COLLECTION DITCH CD-2B	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station Start	Station End	Elevation	Drainage Area (acres) Section	Drainage Area (acres) Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q (CFS) Section	Peak Discharge Q (CFS) Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	With Freeboard: Channel Depth (ft)	With Freeboard: Top Channel Width (ft)	With Freeboard: Q Available (CFS)
0 + 00		2030.0																					
2 + 25		2018.0	6.0	6.0	10	9.0%	85	16.8	16.8	5.3%	0.2	R-3	0.041	5.0	2 : 1	3.7	0.60	7.4	5.11	19.0	0.75	8.0	28.2
5 + 04		2012.0	24.5	30.5	10	9.0%	85	64.4	81.2	2.2%	0.5	R-4	0.042	5.0	2 : 1	15.5	1.80	12.2	5.76	89.2	2.30	14.2	145.2

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-2B**				**Peak Disch & Base Flow:**	**16.8**	
Section Number:	**1**				**Peak Discharge (Cum):**	**16.8**	
End Station:	**2**	**+**	**25**		**Drainage Acreage:**	**6.0**	
End Elevation:	**2,018.0**				**Watershed Slope:**	**9.0%**	

Given:			
Flow Depth, d (ft)	=	0.6	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.041	
Channel Slope, s (ft/ft)	=	5.33%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	18.99	cfs
Q =	28.21	cfs WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	5.11	fps
V_{MAX} =	6.50	fps

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	2.00	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	3.72	sq.ft.	
A =	4.88	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	7.68	feet	
P =	8.35	feet	WITH FREEBOARD

$r = A/P$

r =	0.48	feet	
r =	0.58	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	7.40	feet	
T =	8.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-2B**				**Peak Disch & Base Flow:**	**64.4**	
Section Number:	**2**				**Peak Discharge (Cum):**	**81.2**	
End Station:	**5**	**+**	**04**		**Drainage Acreage:**	**24.5**	
End Elevation:	**2,012.0**				**Watershed Slope:**	**9.0%**	

Given:			
Flow Depth, d (ft)	=	1.8	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.042	
Channel Slope, s (ft/ft)	=	2.15%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	89.22	cfs
Q =	145.21	cfs WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	5.76	fps
V_{MAX} =	9.00	fps

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	2.42	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	15.48	sq.ft.	
A =	22.08	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	13.05	feet	
P =	15.29	feet	WITH FREEBOARD

$r = A/P$

r =	1.19	feet	
r =	1.44	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	12.20	feet	
T =	14.20	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Wed May 28 11:59:28 2025

Project: ROCKWOOD By: CGY Date: 05/28/25

Location: CD-2B(1) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 6.0000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 9.70 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 861.396

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 16.777

Time of Concentration (SCS) Wed May 28 11:49:45 2025

Project: ROCKWOOD By: CGY Date: 05/28/25
Location: CD-2B(1) Checked: Date: 05/28/25
Developed

Curve Number : 85
Length of Flow : 1100.00 ft
Average Land Slope : 9.00 %

Time of Concentration : 0.162 hrs, 9.7 mins

Graphical Peak Discharge Wed May 28 12:01:13 2025

Project: ROCKWOOD By: CGY Date: 05/28/25

Location: CD-2B(2) Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 24.5000Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 11.60 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 809.782

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 64.400

Time of Concentration (SCS) Wed May 28 11:50:26 2025

Project: ROCKWOOD By: CGY Date: 05/28/25
Location: CD-2B(2) Checked: Date: 05/28/25
Developed

Curve Number : 85
Length of Flow : 1379.00 ft
Average Land Slope : 9.00 %

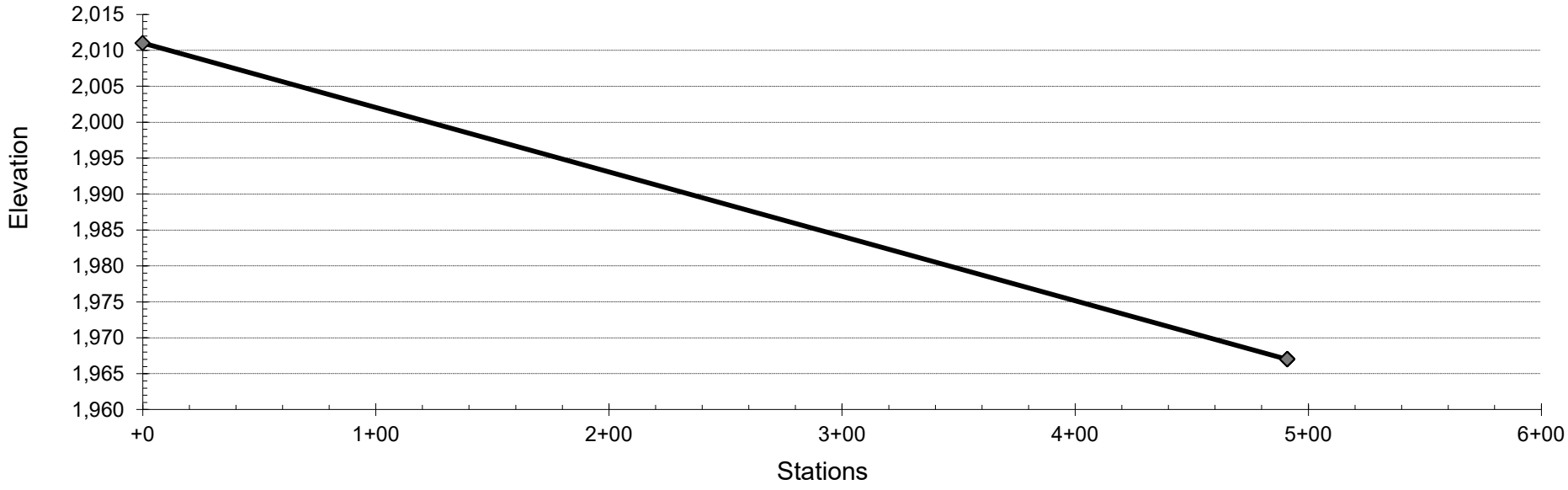
Time of Concentration : 0.194 hrs, 11.6 mins

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
COLLECTION DITCH CD-4	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station			Drainage Area (acres)					Peak Discharge Q (CFS)												With Freeboard		
Start / End	Elevation		Section	Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Section	Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	Channel Depth (ft)	Top Channel Width (ft)	Q Available (CFS)
0 + 00	2011.0																					
4 + 91	1967.0		0.99	0.99	10	10.0%	85	3.2	3.2	9.0%	0.1	R-3	0.047	2.0	2 : 1	1.1	0.40	3.6	4.22	4.7	0.50	4.0	7.1

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-4**				**Peak Disch & Base Flow:**	**3.2**	
Section Number:	**1**				**Peak Discharge (Cum):**	**3.2**	
End Station:	**4**	**+**	**91**		**Drainage Acreage:**	**0.99**	
End Elevation:	**1,967.0**				**Watershed Slope:**	**10.0%**	

Given:			
Flow Depth, d (ft)	=	0.4	
Bottom Width (ft)	=	2	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.047	
Channel Slope, s (ft/ft)	=	8.96%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	4.72	cfs	
Q =	7.14	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	4.22	fps	
V_{MAX} =	6.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	2.24	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	1.12	sq.ft.	
A =	1.50	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	3.79	feet	
P =	4.24	feet	WITH FREEBOARD

$r = A/P$

r =	0.30	feet	
r =	0.35	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	3.60	feet	
T =	4.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Mon Jun 2 12:19:41 2025

Project: ROCKWOOD By: CGY Date: 06/02/25

Location: CD-4 Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 0.9900Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 6.00 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 1000.000

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

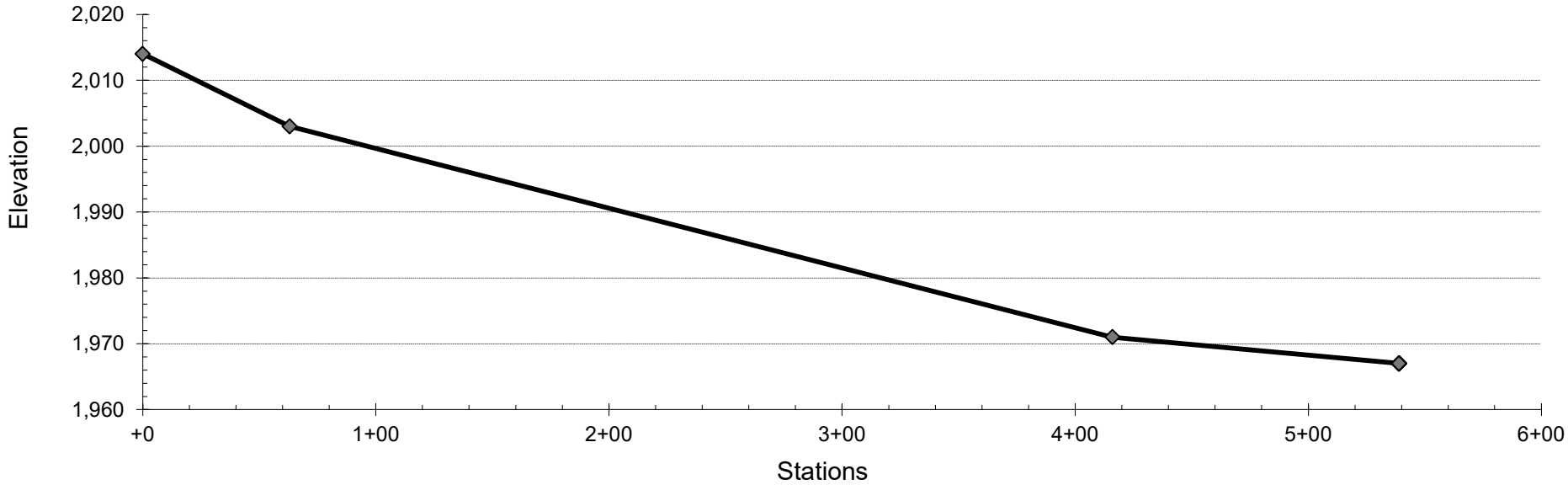
9. Peak Discharge,qp.....cfs = 3.214

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
COLLECTION DITCH CD-5	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station Start	Station End	Elevation	Drainage Area (acres) Section	Drainage Area (acres) Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q (CFS) Section	Peak Discharge Q (CFS) Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	With Freeboard: Channel Depth (ft)	With Freeboard: Top Channel Width (ft)	With Freeboard: Q Available (CFS)
0 + 00		2014.0																					
0 + 63		2003.0	0.99	0.99	10	10.0%	85	3.2	3.2	17.5%	0.1	R-3	0.052	2.0	2 : 1	0.8	0.30	3.2	4.50	3.5	0.38	3.5	5.2
4 + 16		1971.0	0.00	0.99	10	10.0%	85	0.0	3.2	9.1%	0.5	R-3	0.047	2.0	2 : 1	1.1	0.40	3.6	4.24	4.7	0.90	5.6	22.5
5 + 39		1967.0	0.00	0.99	10	10.0%	85	0.0	3.2	3.3%	0.5	GRASS	0.060	2.0	2 : 1	1.5	0.50	4.0	2.23	3.3	1.00	6.0	12.9

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-5**				**Peak Disch & Base Flow:**	**3.2**	
Section Number:	**1**				**Peak Discharge (Cum):**	**3.2**	
End Station:	**0**	**+**	**63**		**Drainage Acreage:**	**0.99**	
End Elevation:	**2,003.0**				**Watershed Slope:**	**10.0%**	

Given:			
Flow Depth, d (ft)	=	0.3	
Bottom Width (ft)	=	2	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.052	
Channel Slope, s (ft/ft)	=	17.46%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	3.51	cfs	
Q =	5.25	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	4.50	fps	
V_{MAX} =	6.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = 0.60 sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = 0.18 sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = 0.08 ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	0.91	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	0.78	sq.ft.	
A =	1.03	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	3.34	feet	
P =	3.68	feet	WITH FREEBOARD

$r = A/P$

r =	0.23	feet	
r =	0.28	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	3.20	feet	
T =	3.50	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**GREATER THAN 10% SLOPE**
SHEAR STRESS CHECK =	**PASS**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-5**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**2**				**Peak Discharge (Cum):**	**3.2**	
End Station:	**4**	**+**	**16**		**Drainage Acreage:**	**0.0**	
End Elevation:	**1,971.0**				**Watershed Slope:**	**10.0%**	

Given:			
Flow Depth, d (ft)	=	0.4	
Bottom Width (ft)	=	2	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.047	
Channel Slope, s (ft/ft)	=	9.07%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	4.75	cfs
Q =	22.46	cfs WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	4.24 fps
V_{MAX} =	6.50 fps

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	2.26	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	1.12	sq.ft.
A =	3.42	sq.ft. WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	3.79	feet
P =	6.02	feet WITH FREEBOARD

$r = A/P$

r =	0.30	feet
r =	0.57	feet WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	3.60	feet
T =	5.60	feet WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**COLLECTION DITCH CD-5**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**3**				**Peak Discharge (Cum):**	**3.2**	
End Station:	**5**	**+**	**39**		**Drainage Acreage:**	**0.0**	
End Elevation:	**1,967.0**				**Watershed Slope:**	**10.0%**	

Given:			
Flow Depth, d (ft)	=	0.5	
Bottom Width (ft)	=	2	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	GRASS	
d_{50} size (inches)	=	#N/A	
Mannings Coefficient	=	0.060	
Channel Slope, s (ft/ft)	=	3.25%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	3.34	cfs
Q =	12.94	cfs WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	2.23	fps
V_{MAX} =	3.50	fps

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = #N/A

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	#N/A	psf
Calculated Shear Stress =	1.01	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	1.50	sq.ft.	
A =	4.00	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	4.24	feet	
P =	6.47	feet	WITH FREEBOARD

$r = A/P$

r =	0.35	feet	
r =	0.62	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	4.00	feet	
T =	6.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Mon Jun 2 12:20:48 2025

Project: ROCKWOOD By: CGY Date: 06/02/25

Location: CD-5 Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 0.9900Acres

   Runoff Curve Number:.....CN = 85

   Time of Concentration:.....Tc = 6.00 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.3529

5. Compute Ia/P..... = 0.0989

6. Unit peak discharge, qu.....csm/in = 1000.000

7. Runoff,Q.....in = 2.077

8. Pond & swap adjustment factor,...Fp = 1.00

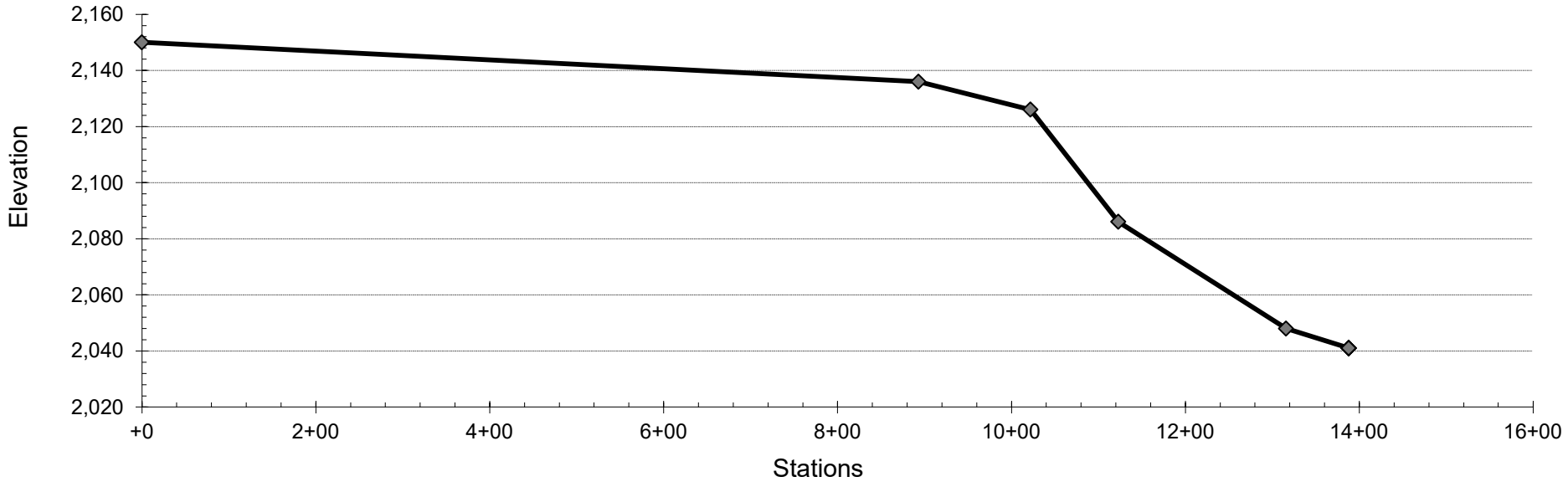
9. Peak Discharge,qp.....cfs = 3.214

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
DIVERSION DITCH DD-1	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station Start	Station End	Elevation	Drainage Area (acres) Section	Drainage Area (acres) Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q (CFS) Section	Peak Discharge Q (CFS) Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	With Freeboard: Channel Depth (ft)	With Freeboard: Top Channel Width (ft)	With Freeboard: Q Available (CFS)
0 + 00		2150.0																					
8 + 93		2136.0	18.0	18.0	10	8.0%	75	22.1	22.1	1.6%	0.3	GRASS	0.050	5.0	2 : 1	7.9	1.10	9.4	3.20	25.3	1.38	10.5	38.5
10 + 22		2126.0	0.0	18.0	10	8.0%	75	0.0	22.1	7.8%	0.5	R-3	0.041	5.0	2 : 1	3.7	0.60	7.4	6.16	22.9	1.10	9.4	68.2
11 + 23		2086.0	0.0	18.0	10	8.0%	75	0.0	22.1	39.6%	0.5	R-4	0.064	5.0	2 : 1	3.0	0.50	7.0	8.15	24.4	1.00	9.0	84.0
13 + 16		2048.0	0.0	18.0	10	8.0%	75	0.0	22.1	19.7%	0.5	R-4	0.058	5.0	2 : 1	3.7	0.60	7.4	6.94	25.8	1.10	9.4	76.8
13 + 88		2041.0	0.0	18.0	10	8.0%	75	0.0	22.1	9.7%	0.5	R-4	0.055	5.0	2 : 1	4.5	0.70	7.8	5.66	25.4	1.20	9.8	67.5

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**DIVERSION DITCH DD-1**				**Peak Disch & Base Flow:**	**22.1**	
Section Number:	**1**				**Peak Discharge (Cum):**	**22.1**	
End Station:	**8**	**+**	**93**		**Drainage Acreage:**	**18.0**	
End Elevation:	**2,136.0**				**Watershed Slope:**	**8.0%**	

Given:			
Flow Depth, d (ft)	=	1.1	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	GRASS	
d_{50} size (inches)	=	#N/A	
Mannings Coefficient	=	0.050	
Channel Slope, s (ft/ft)	=	1.57%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	25.35	cfs
Q =	38.47	cfs WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	3.20	fps
V_{MAX} =	3.50	fps

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = #N/A

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	#N/A	psf
Calculated Shear Stress =	1.08	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	7.92	sq.ft.
A =	10.66	sq.ft. WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	9.92	feet
P =	11.15	feet WITH FREEBOARD

$r = A/P$

r =	0.80	feet
r =	0.96	feet WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	9.40	feet
T =	10.50	feet WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**DIVERSION DITCH DD-1**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**2**				**Peak Discharge (Cum):**	**22.1**	
End Station:	**10**	**+**	**22**		**Drainage Acreage:**	**0.0**	
End Elevation:	**2,126.0**				**Watershed Slope:**	**8.0%**	

Given:			
Flow Depth, d (ft)	=	0.6	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-3	
d_{50} size (inches)	=	3	
Mannings Coefficient	=	0.041	
Channel Slope, s (ft/ft)	=	7.75%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	22.90	cfs	
Q =	68.16	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	6.16	fps	
V_{MAX} =	6.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 9

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	1.00	psf
Calculated Shear Stress =	2.90	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	3.72	sq.ft.	
A =	7.92	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	7.68	feet	
P =	9.92	feet	WITH FREEBOARD

$r = A/P$

r =	0.48	feet	
r =	0.80	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	7.40	feet	
T =	9.40	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**DIVERSION DITCH DD-1**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**3**				**Peak Discharge (Cum):**	**22.1**	
End Station:	**11**	**+**	**23**		**Drainage Acreage:**	**0.0**	
End Elevation:	**2,086.0**				**Watershed Slope:**	**8.0%**	

Given:			
Flow Depth, d (ft)	=	0.5	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.064	
Channel Slope, s (ft/ft)	=	39.60%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	24.44	cfs	
Q =	84.00	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	8.15	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = 3.00 sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = 0.00 sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = 0.00 ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	N/A	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	3.00	sq.ft.	
A =	7.00	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	7.24	feet	
P =	9.47	feet	WITH FREEBOARD

$r = A/P$

r =	0.41	feet	
r =	0.74	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	7.00	feet	
T =	9.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**DIVERSION DITCH DD-1**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**4**				**Peak Discharge (Cum):**	**22.1**	
End Station:	**13**	**+**	**16**		**Drainage Acreage:**	**0.0**	
End Elevation:	**2,048.0**				**Watershed Slope:**	**8.0%**	

Given:			
Flow Depth, d (ft)	=	0.6	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.058	
Channel Slope, s (ft/ft)	=	19.69%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	25.81	cfs	
Q =	76.83	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	6.94	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = 3.00 sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = 0.72 sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = 0.14 ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	1.68	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	3.72	sq.ft.	
A =	7.92	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	7.68	feet	
P =	9.92	feet	WITH FREEBOARD

$r = A/P$

r =	0.48	feet	
r =	0.80	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	7.40	feet	
T =	9.40	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**GREATER THAN 10% SLOPE**
SHEAR STRESS CHECK =	**PASS**
OVERALL CHECK =	**PASS**

Trapezoidal/Triangle Section Ditch

Channel Name:	**DIVERSION DITCH DD-1**				**Peak Disch & Base Flow:**	**0.0**	
Section Number:	**5**				**Peak Discharge (Cum):**	**22.1**	
End Station:	**13**	**+**	**88**		**Drainage Acreage:**	**0.0**	
End Elevation:	**2,041.0**				**Watershed Slope:**	**8.0%**	

Given:			
Flow Depth, d (ft)	=	0.7	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.055	
Channel Slope, s (ft/ft)	=	9.72%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	25.35	cfs	
Q =	67.53	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	5.66	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	4.25	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	4.48	sq.ft.	
A =	8.88	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	8.13	feet	
P =	10.37	feet	WITH FREEBOARD

$r = A/P$

r =	0.55	feet	
r =	0.86	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	7.80	feet	
T =	9.80	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Fri Dec 6 10:20:53 2024

Project: ROCKWOOD QUARRY By: CGY Date: 12/06/24

Location: DD-1 Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 18.0000Acres

   Runoff Curve Number:.....CN = 75

   Time of Concentration:.....Tc = 22.10 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.6667

5. Compute Ia/P..... = 0.1867

6. Unit peak discharge, qu.....csm/in = 580.427

7. Runoff,Q.....in = 1.352

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 22.064

Time of Concentration (SCS) Fri Dec 6 10:19:38 2024

Project: ROCKWOOD QUARRY By: CGY Date: 12/06/24
Location: DD-1 Checked: Date: 12/06/24
Developed

Curve Number : 75
Length of Flow : 1930.72 ft
Average Land Slope : 8.00 %

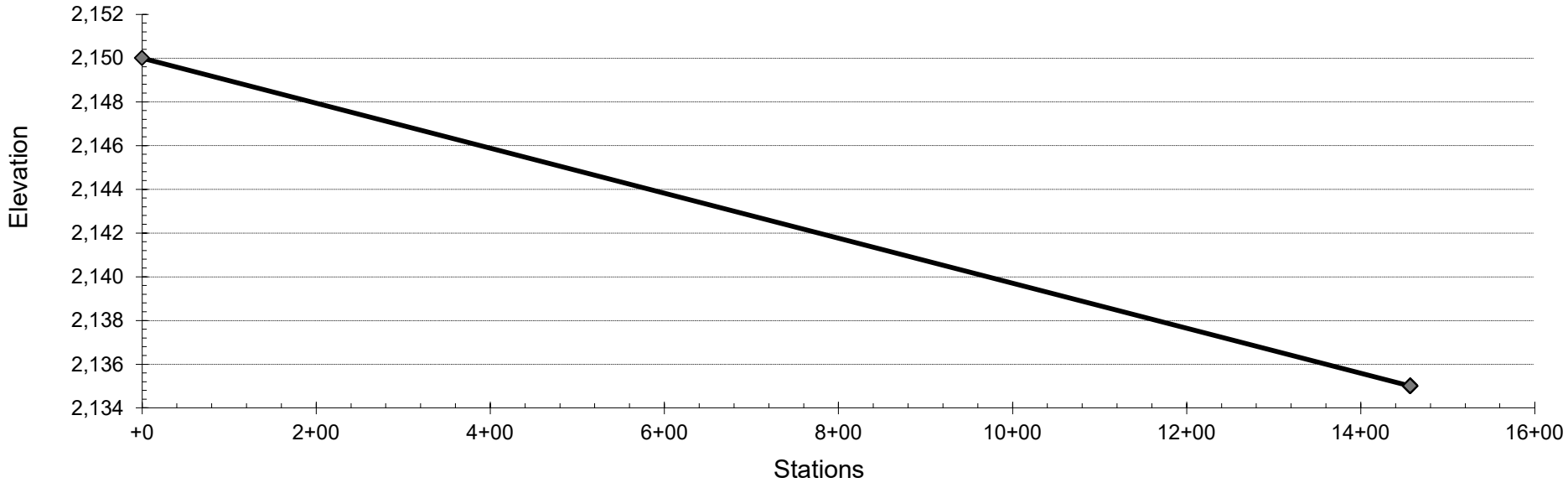
Time of Concentration : 0.368 hrs, 22.1 mins

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
DIVERSION DITCH DD-2	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **JUNE 2025**	Sheet **1** of **1**

Station			Drainage Area (acres)					Peak Discharge Q (CFS)												With Freeboard		
Start / End	Elevation		Section	Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Section	Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	Channel Depth (ft)	Top Channel Width (ft)	Q Available (CFS)
0 + 00	2150.0																					
14 + 57	2135.0		109.4	109.4	10	5.0%	75	72.9	72.9	1.0%	0.6	GRASS	0.060	5.0	2 : 1	23.5	2.40	14.6	3.29	77.4	3.00	17.0	122.6

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**DIVERSION DITCH DD-2**				**Peak Disch & Base Flow:**	**72.9**	
Section Number:	**1**				**Peak Discharge (Cum):**	**72.9**	
End Station:	**14**	**+**	**57**		**Drainage Acreage:**	**109.4**	
End Elevation:	**2,135.0**				**Watershed Slope:**	**5.0%**	

Given:			
Flow Depth, d (ft)	=	2.4	
Bottom Width (ft)	=	5	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	GRASS	
d_{50} size (inches)	=	#N/A	
Mannings Coefficient	=	0.060	
Channel Slope, s (ft/ft)	=	1.03%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n) \times a \times r^{2/3} \times s^{1/2}$

Q =	77.38	cfs	
Q =	122.58	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	3.29	fps	
V_{MAX} =	3.50	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = #N/A

$A_{void}=0.4*b*t$

A_{void} = N/A sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = #VALUE! sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = #VALUE! ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4 \times d_{in\text{-}channel\ flow} \times s$

Allowable Shear Stress =	#N/A	psf
Calculated Shear Stress =	1.54	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	23.52	sq.ft.	
A =	33.00	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	15.73	feet	
P =	18.42	feet	WITH FREEBOARD

$r = A/P$

r =	1.49	feet	
r =	1.79	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	14.60	feet	
T =	17.00	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

Graphical Peak Discharge Fri Dec 6 11:53:16 2024

Project: ROCKWOOD QUARRY By: CGY Date: 12/06/24

Location: DD-2 Checked: Date:

Developed

1. Data:

   Drainage area:.....A = 109.4000Acres

   Runoff Curve Number:.....CN = 75

   Time of Concentration:.....Tc = 65.10 min

   Storm Type:..... = II

   Pond and swamp areas spread
   throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 3.570

4. Initial abstraction, Ia..... = 0.6667

5. Compute Ia/P..... = 0.1867

6. Unit peak discharge, qu.....csm/in = 315.538

7. Runoff,Q.....in = 1.352

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 72.901

Time of Concentration (SCS) Fri Dec 6 11:52:05 2024

Project: ROCKWOOD QUARRY By: CGY Date: 12/06/24
Location: DD-2 Checked: Date: 12/06/24
Developed

Curve Number : 75
Length of Flow : 5563.50 ft
Average Land Slope : 5.00 %

Time of Concentration : 1.086 hrs, 65.1 mins

CULV-2 Design Mon Jun 2 12:55:11 2025

Design Parameters

Section

Shape:	Circular	
Material:	HDPE	
Diameter:	12.00	in
Manning's n:	0.0120	
Number of Barrels:	1	

Inlet

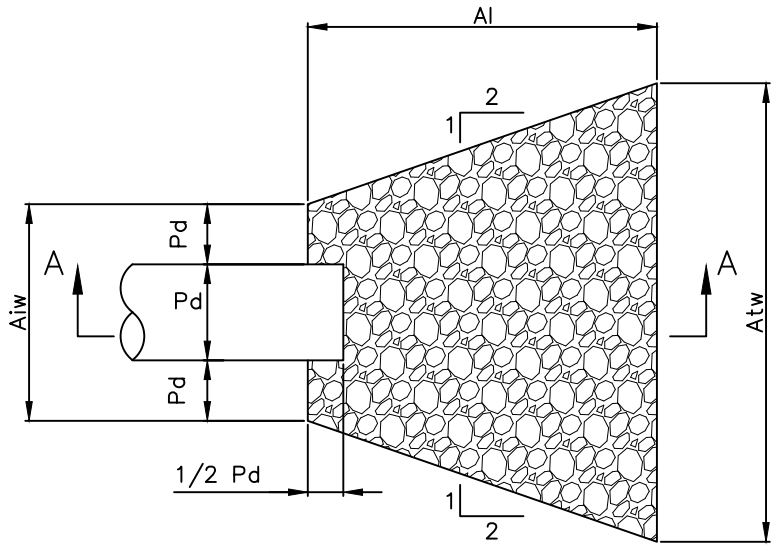
Inlet Type:	Mitered to Slope	
Ke:	0.70	

Inverts

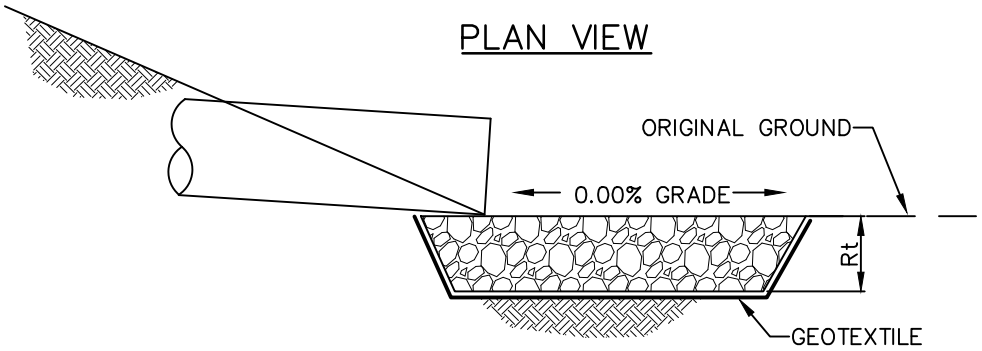
Inlet Invert Elevation:	1987.000	ft
Outlet Invert Elevation:	1986.400	ft
Length:	30.000	ft
Slope:	2.00	%

Culvert Calculation

Discharge:	5.46	cfs
Headwater Elevation:	1990.000	ft
Tailwater Elevation:	0.000	ft
Downstream Velocity:	7.92	ft/s
Downstream Flow Depth:	0.820	ft
Critical Flow Depth:	0.938	ft
Normal Flow Depth:	0.820	ft
Flow Control Type:	Inlet Control, Submerged	



PLAN VIEW



SECTION A–A

OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP		APRON		
		SIZE R––	THICK. Rt (IN)	LENGTH Al (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH Atw (FT)
CULV–1	36	5	27	20	9	29
CULV–2	12	4	18	8	3	11
SP–1 PRINCIPAL	18	4	18	8	4.5	12.5
SP–2 PRINCIPAL	(2X) 18	4	18	12	7	19
DD–1	N/A	4	18	16	5	21
DD–2	N/A	3	9	26	5	31

NOTES:

ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.

ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIPRAP WITHIN THE APRON SHALL BE REPLACED IMMEDIATELY.

EXTEND RIPRAP ON BACK SIDE OF APRON TO AT LEAST 1/2 DEPTH OF PIPE ON BOTH SIDES TO PREVENT SCOUR AROUND THE PIPE.

STANDARD CONSTRUCTION DETAIL #9-2
RIPRAP APRON AT PIPE OUTLET
NO FLARED ENDWALL

NOT TO SCALE

STANDARD E&S WORKSHEET # 19
Sediment Trap Design Data

PROJECT NAME: ROCKWOOD STONE, LLC - ROCKWOOD QUARRY
LOCATION: BLACK TOWNSHIP, SOMERSET COUNTY
PREPARED BY: CGY DATE: JUNE 2025
CHECKED BY: BV DATE: JUNE 2025

TRAP NUMBER		ST-1	ST-2
DRAINAGE AREA (5 ACRES MAX)	(AC)	0.99	0.99
REQUIRED CAPACITY (2,000 CF/AC) (CF)		1,980	1,980
CAPACITY PROVIDED AT ELEVATION h	(CF)	2,197	2,197
SOIL TYPES IN DRAINAGE AREA		SILT LOAM	SILT LOAM
REQUIRED SURFACE AREA (5,300 x AC)[1] (SQ. FT)		N/A	N/A
* AVERAGE BOTTOM LENGTH	(FT)	25	25
* AVERAGE BOTTOM WIDTH	(FT)	8	8
* AVERAGE TRAP LENGTH AT ELEVATION h	(FT)	41	41
* AVERAGE TRAP WIDTH AT ELEVATION h	(FT)	24	24
SURFACE AREA AT ELEVATION h	(SQ FT)	984	984
BOTTOM ELEVATION	(FT)	1963.0	1963.0
CLEAN-OUT ELEVATION (@ 700 CF/AC)[2]	(FT)	1965.0	1965.0
TOP OF EMBANKMENT ELEVATION[3]	(FT)	1968.0	1968.0
EMBANKMENT HEIGHT	(FT)	5.0	5.0
CREST OF SPILLWAY ELEVATION[4]	(FT)	1967.0	1967.0
FLOW LENGTH AT ELEVATION h	(FT)	41	41
FLOW LENGTH/WIDTH RATIO AT ELEV. h[5] (2:1 MIN)		2:1	2:1

1 If sandy clays, silty clays, silty clay loams, clay loams, or clays predominate soil types.
2 Minimum 12” above bottom of trap
3 Minimum 12” above elevation at which 1.5 cfs/acre discharge capacity is provided.
4 Minimum 24” above bottom of trap
5 4:1 Flow Length:Width ratio required for HQ and EV watersheds.

EMBANKMENT SPILLWAYS

OUTLET WIDTH (2 x # ACRES MIN.)[1]	(FT)	6	6
SPILLWAY HEIGHT h	(FT)	2.0	2.0
OUTLET SIDE SLOPES	(2H:1V MAX.)	2H:1V	2H:1V
SPILLWAY OUTSIDE SLOPE Z1	(2 MIN.)	2	2
SPILLWAY INSIDE SLOPE Z2	(2 MIN.)	2	2

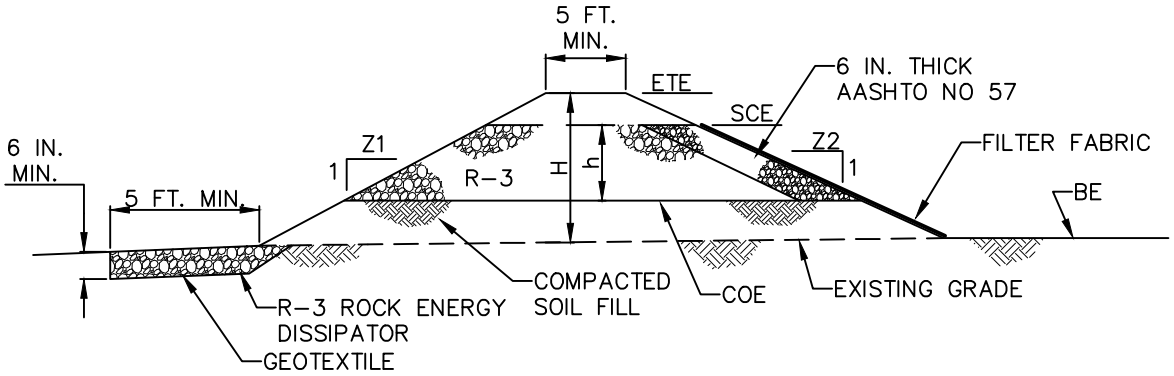
1 6 x # Acres Min. if not discharging directly to a waterway

RISER PIPE SPILLWAYS

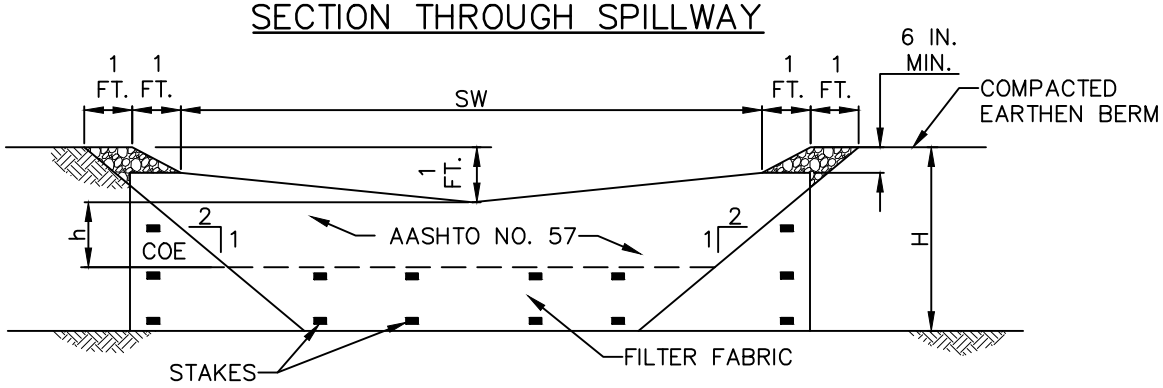
Dr (RISER DIAMETER, 8” MIN.)	(IN)	N/A	N/A
Db (BARREL DIAMETER, 6” MIN.)	(IN)	N/A	N/A
SPILLWAY CAPACITY WITH 12” FREEBOARD	(CFS)	N/A	N/A
BARREL OUTLET ELEVATION	(FT)	N/A	N/A
MAX WATER SURFACE ELEVATION (@ 1.5 CFS/AC. DISCHARGE)	(FT)	N/A	N/A

OUTLET BASIN

LENGTH (6 Db)	(FT)	N/A	N/A
WIDTH (3 Db)	(FT)	N/A	N/A
DEPTH (Db)	(FT)	N/A	N/A
RIPRAP PROTECTION	(R-Size, R-3 min.)	N/A	N/A



SECTION THROUGH SPILLWAY



INSIDE FACE

TRAP NO.	Z1 (FT)	Z2 (FT)	H (FT)	h (FT)	EMBANK. TOP ELEV. ETE (FT)	SPILLWAY CREST ELEV. SCE (FT)	CLEAN OUT ELEV. COE (FT)	BOTTOM ELEV. BE (FT)	SPILLWAY WIDTH SW (FT)
ST-1	2	2	5	2	1968.0	1967.0	1965.0	1963.0	6
ST-2	2	2	5	2	1968.0	1967.0	1965.0	1963.0	6

NOTES:

EMBANKMENT OUTLET SHALL BE COMPOSED ENTIRELY OF ROCK ABOVE CLEAN OUT ELEVATION (COE); MAIN BODY R-3 OR LARGER -- R-4 TO BE USED FOR DRAINAGE AREAS GREATER THAN 3.0 ACRES, INSIDE FACE AASHTO # 57 STONE OR SMALLER. A 6 IN. THICK LAYER OF COMPOST, COMPOST SOCK, OR CLEAN SAND SHALL BE INSTALLED ON TOP OF THE AASHTO #57 STONE AND SECURELY ANCHORED IN HQ WATERSHEDS. 24 IN. DIAMETER COMPOST SOCK(S) SHALL BE USED IN PLACE OF FILTER FABRIC AND AASHTO #57 STONE IN EV WATERSHEDS.

FILL MATERIAL FOR THE EMBANKMENTS SHALL BE FREE OF ROOTS, OR OTHER WOODY VEGETATION, ORGANIC MATERIAL, LARGE STONES, AND OTHER OBJECTIONABLE MATERIALS. THE EMBANKMENT SHALL BE COMPACTED IN LAYERED LIFTS OF NOT MORE THAN 9 IN.. THE MAXIMUM ROCK SIZE SHALL BE NO GREATER THAN 6 IN.
UPON COMPLETION, THE EMBANKMENT SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED ACCORDING TO THE SPECIFICATIONS OF THE E&S PLAN DRAWINGS.

ALL SEDIMENT TRAPS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT.

ACCESS FOR SEDIMENT REMOVAL AND OTHER REQUIRED MAINTENANCE ACTIVITIES SHALL BE PROVIDED.

A CLEAN OUT STAKE SHALL BE PLACED NEAR THE CENTER OF EACH TRAP. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED THE CLEAN OUT ELEVATION ON THE STAKE AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS. DISPOSE OF MATERIALS REMOVED FROM THE TRAP IN THE MANNER DESCRIBED IN THE E&S PLAN.

CHECK EMBANKMENTS, SPILLWAYS, AND OUTLETS FOR EROSION, PIPING AND SETTLEMENT. CLOGGED OR DAMAGED SPILLWAYS AND/OR EMBANKMENTS SHALL BE IMMEDIATELY RESTORED TO THE DESIGN SPECIFICATIONS.

DISPLACED RIPRAP WITHIN THE SPILLWAY OR OUTLET PROTECTION SHALL BE REPLACED IMMEDIATELY.

ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISTURBED AREAS INSIDE THE TRAP SHALL BE STABILIZED BEFORE CONVERSION TO A STORMWATER MANAGEMENT FACILITY. TO ASSIST IN REMOVING SEDIMENT, WHICH MAY BE SATURATED, A DEVICE SUCH AS IS SHOWN IN STANDARD CONSTRUCTION DETAIL #7-18 MAY BE USED TO DEWATER THE SEDIMENT PRIOR TO ITS REMOVAL.

STANDARD CONSTRUCTION DETAIL #8-1
EMBANKMENT SEDIMENT TRAP

NOT TO SCALE

ST-1 Report Mon Jun 9 08:31:45 2025

Top of dam elevation: 1968.0000
Bottom of pond elevation: 1963.0000
Top of dam width: 5.0000
Cut Slope: 50.00% 2.000:1 26.57°
Fill Slope: 33.33% 3.000:1 18.43°
Interior Slope: 50.00% 2.000:1 26.57°
Existing Surface: Z:\Mining\Rockwood Stone, LLC\Dwgs&Data\TIN Files\2020 PASDA.tin

Pond Earthwork Volumes
Total cut : 3,553.19 C.F., 131.60 C.Y.
Total fill: 1,740.19 C.F., 64.45 C.Y.

Pond Storage Volumes

Water Elev	Storage(AcreFt)	(C.Y.)	(C.F.)	(Gallons)	Area(Acre)
1963.00	0.00000	0.0	0.0	0.0	0.005
1963.50	0.00269	4.3	117.2	876.5	0.006
1964.00	0.00623	10.0	271.3	2029.7	0.008
1964.50	0.01071	17.3	466.5	3489.7	0.010
1965.00	0.01622	26.2	706.7	5286.2	0.012
1965.50	0.02286	36.9	995.8	7449.4	0.014
1966.00	0.03072	49.6	1338.0	10008.9	0.017
1966.50	0.03988	64.3	1737.2	12994.9	0.020
1967.00	0.05044	81.4	2197.3	16437.2	0.023
1967.50	0.06250	100.8	2722.5	20365.7	0.026
1968.00	0.07614	122.8	3316.7	24810.4	0.029

ST-2 Report Mon Jun 9 08:40:54 2025

Top of dam elevation: 1968.0000
Bottom of pond elevation: 1963.0000
Top of dam width: 5.0000
Cut Slope: 50.00% 2.000:1 26.57°
Fill Slope: 33.33% 3.000:1 18.43°
Interior Slope: 50.00% 2.000:1 26.57°
Existing Surface: Z:\Mining\Rockwood Stone, LLC\Dwgs&Data\TIN Files\2020 PASDA.tin

Pond Earthwork Volumes
Total cut : 3,421.64 C.F., 126.73 C.Y.
Total fill: 1,463.51 C.F., 54.20 C.Y.

Pond Storage Volumes

Water Elev	Storage(AcreFt)	(C.Y.)	(C.F.)	(Gallons)	Area(Acre)
1963.00	0.00000	0.0	0.0	0.0	0.005
1963.50	0.00269	4.3	117.2	876.5	0.006
1964.00	0.00623	10.0	271.3	2029.7	0.008
1964.50	0.01071	17.3	466.5	3489.7	0.010
1965.00	0.01622	26.2	706.7	5286.2	0.012
1965.50	0.02286	36.9	995.8	7449.4	0.014
1966.00	0.03072	49.6	1338.0	10008.9	0.017
1966.50	0.03988	64.3	1737.2	12994.9	0.020
1967.00	0.05044	81.4	2197.3	16437.2	0.023
1967.50	0.06250	100.8	2722.5	20365.7	0.026
1968.00	0.07614	122.8	3316.7	24810.4	0.029

Module 13: Impoundments/Treatment Facilities

[§§77.457/77.461/77.526/77.531/Chapter 105]

13.1 Treatment

Provide a plan for the treatment of surface and groundwater drainage from the areas disturbed by the mining activities. Include a construction and treatment narrative, flow diagram, design criteria, and design calculations (which include the proposed capacity) of the treatment facilities. Identify treatment chemicals to be used. Do not include any facilities included in Module 12.

Water treatment will consist primarily of clarification of the suspended solids associated with mining operations. Water will be clarified primarily by settling within the pit sump. Pit water may be pumped into a functioning sediment pond when necessary. Should it prove necessary, flocculants may be added at the sediment ponds via gel logs placed in the inflow. This should only be done if the water contains colloidal fine particles that cannot be settled with simple retention.

13.2 Quarry/Pit Sump

Provide a description of the sump including size, location, depth, method of pumping, etc. (Key location to Exhibits 6.2 and 9).

A pit sump will be constructed at the lowest point of all pits to collect runoff from the pit workings. Electric or diesel pumps will be used to pump water from the pit sump to Sediment Pond SP-1 or SP-2 for additional settling time and discharge. The pit sump has been designed to capture runoff from the entire pit footprint. A 10-year rainfall was used to size the pit sump. Water will be pumped out of the sump into SP-1 or SP-2 at an approximate rate of 1.5 cfs. Pumped water circulating through Sediment Pond SP-1 or SP-2 will provide approximately 12 hours of additional retention time prior to discharging.

13.3 Dams and Impoundments (General) Do not include any facilities included in Module 12

a) Proposed use. Sediment Pond SP-1 will be used to control runoff from the proposed processing pad and part of the mining area (Phase 1 and part of Phase 3). Sediment Pond SP-2 will be used to control runoff from the remaining portion of the mining area (Phase 2 and part of Phase 3). Two process ponds will be constructed to settle fines generated by washing aggregate products.

b) Map and location (key to maps). See Exhibit 9 for locations.

c) Provide a design report and construction plans and specifications to include detailed cross-sections and plan view scale drawings of the proposed structure which show: principal spillway, dewatering devices, embankment details (including maximum height, top width, and cutoff trench), crest of emergency spillway and existing ground.

See Exhibit 13 Sheets 1, 2, and 3. Hydrocad software was used to perform the design calculations.

Sediment pond SP-1 will control 65.5 acres. It was designed with a minimum of 7,000 cubic feet per acre capacity with a minimum of 2,000 cubic feet per acre designated to sediment storage and 5,000 cubic feet per acre for the dewatering zone. The 50-year, 24-hour storm (5.05") was used to design the emergency spillway, while the 10-year, 24-hour storm (3.57") was used to size the principal spillway. The resulting emergency spillway has a crest length of 60 feet. The principal spillway has a diameter of 18 inches. The dewatering pipe was designed so that the pond would dewater in 4 to 7 days. A dewatering pipe of 6 inches was chosen due to the size of the pond and longevity of the site.

Sediment pond SP-2 will control 81.7 acres. It was designed with a minimum of 7,000 cubic feet per acre capacity with a minimum of 2,000 cubic feet per acre designated to sediment storage and 5,000 cubic feet per acre for the dewatering zone. The 50-year, 24-hour storm (5.05") was used to design the emergency spillway, while the 10-year, 24-hour storm (3.57") was used to size the principal spillway. The resulting emergency spillway has a crest length of 76 feet. The principal spillway has two barrels, each with a diameter of 18 inches. The dewatering pipe was designed so that the pond would dewater in 4 to 7 days. A dewatering pipe of 6 inches was chosen due to the size of the pond and longevity of the site.

Two process ponds will be constructed to settle fines created by a closed loop sand washing system. The water will be pumped from the lower pond to the washing area on the process pad. The washing will be done with equipment designed for this purpose such as sand screw or other type. The fines pulled from the product will flow through a pipe into the first process pond. The fines will settle out via gravity and primarily gather in the first pond. The water will then circulate into the second (lower) pond, where it will be pumped out and provided back to the wash plant. The system is closed loop. Cleaning will take place regularly, and will be performed by excavators dipping out the fines and loading haul trucks. The material will be taken back to open pits where the aggregate was mined from and placed in the backfill. The ponds have been designed to have large top widths for equipment access and will be constructed well in excess of minimum embankment criteria. The process water ponds cannot follow a typical sediment or treatment pond design and will likely involve some field changes to perfect the settling efficiency. Minimum 2.5h:1v out slopes and 25-foot top widths have been utilized to allow vegetation and stability. Flow curtains or baffles may be installed. Water for the system may be sourced from onsite ponds and pumping from Rhoades Creek.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

E-TEMPLATE
SEDIMENT POND CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: SP-1 NPDES Outfall ID #: 001

Location (point of discharge): Latitude (DMS): 39° 54' 22" Longitude (DMS): 79° 09' 24"

Drainage Area: 65.5 acres Design Storm: 50 year / 24 hour Rainfall Amount: 5.05 inches

Average Watershed Slope: 6% Land Use: Quarry Soil Type: C Curve Number: 85

Peak Discharge: 156.8 cubic feet/second NPDES Average Flow: 0.80 mgd NPDES Design Flow: 130.9 mgd

		Permit Application	***As Constructed***
Embankment	Top Width (Minimum)	10'	
	Outside Slope (Maximum) (H:V)	3h:1v	
	Inside Slope (Maximum) (H:V)	3h:1v	
	Top Elevation	1974.0	
	Bottom Elevation	1959.0	
	Upstream Toe Elevation	1962.0	
	Downstream Toe Elevation	1928.0	
	Type of Cover	Vegetation	
	Incised Slope (if any)		
	Inside Slope (Maximum) (H:V)	0.25h:1v(virgin rock only)	
	Top Elevation		
	Bottom Elevation		
Principal Spillway	Type	Barrel	
	Conduit Diameter (if barrel/riser give both)	18"	
	Inlet Elevation	1970.0	
	Outlet Protection	R-4 Rip-Rap	
	Spillway Capacity (cubic feet/second)	7.6 cfs	
Dewatering Device	Type/Size	6" Perf PVC w/capped top	
	Inlet Elevation	1963.5	
	Discharge Regulation (self-draining or valved)	Valved	
	Discharge Capacity (cubic feet/second)	2.47 cfs	
	Time to Dewater Full Pond	5.26 days	
Emergency Spillway	Type	Trapezoidal Weir	
	Width	60'	
	Depth (with 2 feet of freeboard)	3.0'	
	Length	50' / (20' Control)	
	Sideslopes (H:V)	2h:1v	
	Crest Elevation	1971.0	
	Slope	16.7%	
	Type of Lining/Protection	R-4 Rip-Rap	
	Spillway Capacity (provide design calculations)	202.5 cfs	
Storage Capacity	Length @ Bottom	586'	
	Width @ Bottom	35'	
	Length @ Dewatering Device	619'	
	Width @ Dewatering Device	62'	
	Volume @ Dewatering Device	131,304 cf	
	Length @ Principal Spillway	652'	
	Width @ Principal Spillway	101'	
	Volume @ Principal Spillway	467,486 cf	
	Length @ Crest of Emergency Spillway	658'	
	Width @ Crest of Emergency Spillway	107'	
	Volume @ Crest of Emergency Spillway	608,418 cf	

Will the sediment pond be constructed in previously disturbed, fractured, or unconsolidated material? ☐ Yes ☒ No

If yes, specify the type of liner that will be used: _____

SEDIMENT POND CONSTRUCTION CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: SP-1 NPDES Outfall ID #: 001

1.	Has the facility been constructed at the location shown in the approved permit?	☐ Yes	☐ No	
2.	Is the emergency spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	
3.	Is the principal spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	☐ NA
4.	Is the dewatering device constructed at the location shown in the approved plan?	☐ Yes	☐ No	
5.	Are the collection channel inlets constructed at the location shown in the approved plan?	☐ Yes	☐ No	
6.	Do the collection channel inlets have adequate inlet protection?	☐ Yes	☐ No	
7.	Has the liner been installed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
8.	Has the non-discharge alternative been constructed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
9.	Was coal encountered during construction of the pond?	☐ Yes	☐ No	
10.	If yes, was a liner used?	☐ Yes	☐ No	
11.	Identify any conditions or deficiencies in the facility that need to be corrected.			☐ NA

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation, non-discharge alternative construction)	Date of Inspection	Inspected By

Supervising Professional Engineer/Registered Professional Land Surveyor _____

Address and phone _____

I certify in accordance with 25 Pa Code Section 77.531, 87.112, 89.101, or 90.112 that the above-mentioned structure is complete and has been constructed.

_____
Signature of Registered Professional Engineer/Registered Professional Land Surveyor Date

SEAL

_____
Registration Number and Expiration Date

_____ _____
Signature of Permittee or Responsible Official Date Title

SP-1 Report Wed May 28 13:17:34 2025

Top of dam elevation: 1974.0000
Bottom of pond elevation: 1959.0000
Top of dam width: 10.0000
Cut Slope: 50.00% 2.000:1 26.57°
Fill Slope: 33.33% 3.000:1 18.43°
Interior Slope: 33.33% 3.000:1 18.43°
Existing Surface: Z:\Mining\Rockwood Stone, LLC\Dwgs&Data\TIN Files\2020 PASDA.tin

Pond Earthwork Volumes
Total cut : 975,554.63 C.F., 36,131.65 C.Y.
Total fill: 650,214.26 C.F., 24,082.01 C.Y.

Pond Storage Volumes

Water Elev	Storage(AcreFt)	(C.Y.)	(C.F.)	(Gallons)	Area(Acre)
1959.00	0.00000	0.0	0.0	0.0	0.473
1959.50	0.24663	397.9	10743.0	80363.2	0.515
1960.00	0.51484	830.6	22426.5	167762.2	0.558
1960.50	0.80486	1298.5	35059.7	262264.4	0.602
1961.00	1.11688	1801.9	48651.3	363937.2	0.646
1961.50	1.45112	2341.1	63210.6	472847.9	0.691
1962.00	1.80777	2916.5	78746.4	589064.0	0.736
1962.50	2.18705	3528.4	95267.8	712652.8	0.781
1963.00	2.58916	4177.2	112783.9	843681.8	0.827
1963.50	3.01431	4863.1	131303.5	982218.2	0.873
1964.00	3.46271	5586.5	150835.7	1128329.5	0.920
1964.50	3.93456	6347.8	171389.6	1282083.1	0.967
1965.00	4.43008	7147.2	192974.1	1443546.3	1.015
1965.50	4.94945	7985.1	215598.2	1612786.6	1.063
1966.00	5.49291	8861.9	239271.0	1789871.3	1.111
1966.50	6.06064	9777.8	264001.4	1974867.8	1.160
1967.00	6.65286	10733.3	289798.5	2167843.4	1.209
1967.50	7.26977	11728.6	316671.3	2368865.7	1.259
1968.00	7.91159	12764.0	344628.7	2578001.9	1.309
1968.50	8.57851	13840.0	373679.9	2795319.4	1.359
1969.00	9.27075	14956.8	403833.7	3020885.7	1.410
1969.50	9.98850	16114.8	435099.2	3254768.1	1.461
1970.00	10.73199	17314.3	467485.5	3497034.0	1.513
1970.50	11.50141	18555.6	501001.4	3747750.7	1.565
1971.00	12.29697	19839.1	535656.1	4006985.7	1.617
1971.50	13.11888	21165.1	571458.5	4274806.4	1.670
1972.00	13.96735	22534.0	608417.7	4551280.1	1.724
1972.50	14.84258	23946.0	646542.6	4836474.2	1.777
1973.00	15.74477	25401.6	685842.2	5130456.1	1.831
1973.50	16.67414	26901.0	726325.7	5433293.2	1.886
1974.00	17.63090	28444.5	768001.9	5745052.8	1.941

Time of Concentration (SCS) Mon Jan 20 10:45:13 2025

Project: ROCKWOOD By: CGY Date: 01/20/25
Location: SP-1 Checked: Date: 01/20/25
Developed

Curve Number : 85
Length of Flow : 4604.00 ft
Average Land Slope : 6.00 %

Time of Concentration : 0.622 hrs, 37.3 mins

SP-1 Emergency Spillway Design Thu May 29 11:50:28 2025

Shape:	Trapezoidal	
Side Slope Ratio (V:H):	0.50	
Crest Length:	60.00	ft
Invert Elevation:	1971.00	ft
Coefficient:	2.63	
Number of Openings:	1	

Calculation Result

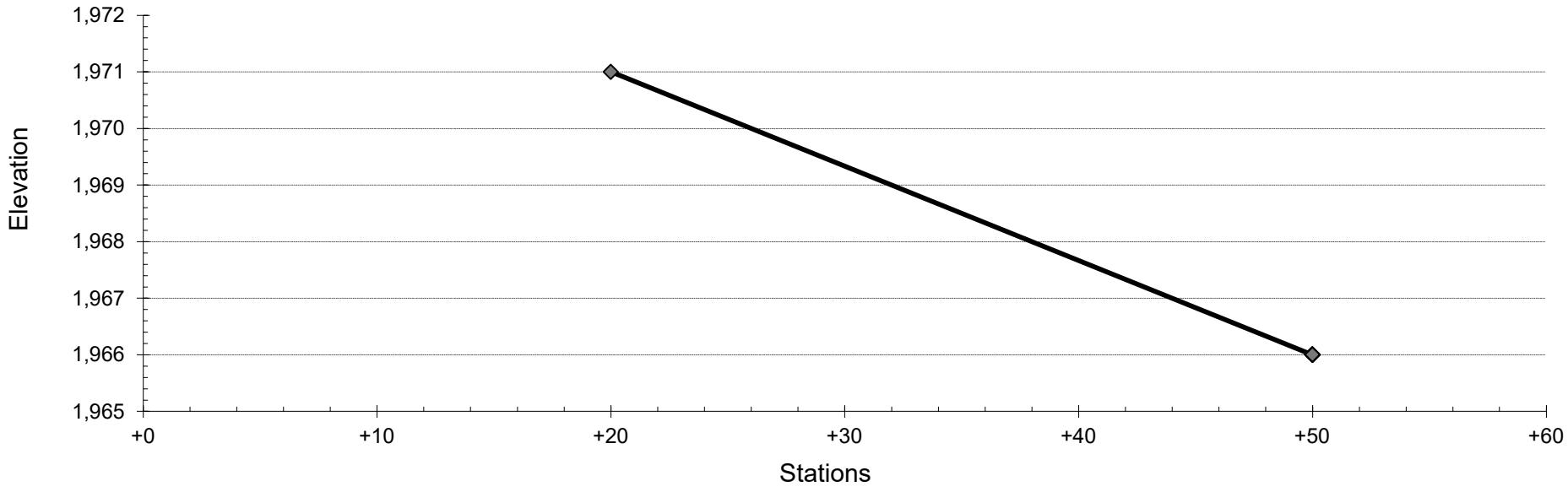
Headwater Elevation:	1972.000	ft
Discharge:	202.510	cfs
Velocity:	3.266	ft/s

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
SP-1 EMS	**ROCKWOOD QUARRY**	**ROCKWOOD STONE, LLC**	
Prepared By: **Earthtech, Inc.** Initials: **CGY**	Telephone Number: **(814)266-6402**	Date: **MAY 2025**	Sheet **1** of **1**

Station Start	Station End	Elevation	Drainage Area (acres) Section	Drainage Area (acres) Cum.	Design Storm (yrs)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q (CFS) Section	Peak Discharge Q (CFS) Cum.	Channel Bed Slope (%)	Free-board (ft)	Channel Lining (specify average rock size)	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes (H : V)	Flow Area (sq ft)	Flow Depth (ft)	Top Flow Width (ft)	Flow Velocity (ft/sec)	Q Available (CFS)	With Freeboard: Channel Depth (ft)	With Freeboard: Top Channel Width (ft)	With Freeboard: Q Available (CFS)
0 + 20		1971.0																					
0 + 50		1966.0	65.5	65.5	50	6.0%	85	202.5	202.5	16.7%	0.5	R-4	0.062	60.0	2 : 1	32.4	0.53	62.1	6.32	204.5	1.03	64.1	297.2

Ditch Profile



Trapezoidal/Triangle Section Ditch

Channel Name:	**SP-1 EMS**				**Peak Disch & Base Flow:**	**202.5**	
Section Number:	**1**				**Peak Discharge (Cum):**	**202.5**	
End Station:	**0**	**+**	**50**		**Drainage Acreage:**	**65.5**	
End Elevation:	**1,966.0**				**Watershed Slope:**	**6.0%**	

Given:			
Flow Depth, d (ft)	=	0.53	
Bottom Width (ft)	=	60	
Side Slopes (H:1)	=	2	
What size Rip Rap	=	R-4	
d_{50} size (inches)	=	6	
Mannings Coefficient	=	0.062	
Channel Slope, s (ft/ft)	=	16.67%	

Flow Rate, Q_{design} (cfs)

$Q = (1.486/n)\ x\ a\ x\ r^{2/3}\ x\ s^{1/2}$

Q =	204.54	cfs	
Q =	297.18	cfs	WITH FREEBOARD

Velocity, V (fps)

Use V to size rip rap if s < 10%, grouted, or $d_{actual} \leq 0$

$V = Q/A$

V =	6.32	fps	
V_{MAX} =	9.00	fps	

Account for 40% Void Space in Rip Rap

if s ≥ 10%

Rip Rap Thickness, t (inches) = 18

$A_{void}=0.4*b*t$

A_{void} = 36.00 sq.ft.

$A_{in\text{-}channel\ flow}=A-A_{void}$

$A_{in\text{-}channel\ flow}$ = -3.64 sq.ft.

$$d_{in-channel\ flow} = \frac{-b + \sqrt{b^2 + 4 * z * A_{in-channel\ flow}}}{2 * z}$$

$d_{in\text{-}channel\ flow}$ = -0.06 ft

Shear Stress Calculation

Use Sh to size rip rap if s > 10%

$Sh = 62.4\ x\ d_{in\text{-}channel\ flow}\ x\ s$

Allowable Shear Stress =	2.00	psf
Calculated Shear Stress =	N/A	psf

Cross Sectional Area, Wetted Perimeter & Hydraulic Radius

$A = bd + zd^2$

A =	32.36	sq.ft.	
A =	40.63	sq.ft.	WITH FREEBOARD

$P = b + 2d\ SQRT(z^2+1)$

P =	62.37	feet	
P =	62.96	feet	WITH FREEBOARD

$r = A/P$

r =	0.52	feet	
r =	0.65	feet	WITH FREEBOARD

Top Width (feet)

$T = b + 2*z*d$

T =	62.12	feet	
T =	62.65	feet	WITH FREEBOARD

Ditch Sizing Check

Q CHECK =	**PASS**
VELOCITY CHECK =	**PASS**
SHEAR STRESS CHECK =	**USE VELOCITY**
OVERALL CHECK =	**PASS**

SP-1 Principal Spillway Design Tue Jan 14 15:52:02 2025

Design Parameters

Section		
Shape:	Circular	
Material:	HDPE	
Diameter:	18.00	in
Manning's n:	0.0120	
Number of Barrels:	1	
Inlet		
Inlet Type:	Thin Edge Projecting	
Ke:	0.90	
Inverts		
Inlet Invert Elevation:	1970.000	ft
Outlet Invert Elevation:	1969.200	ft
Length:	40.000	ft
Slope:	2.00	%

Culvert Calculation

Discharge:	7.55	cfs
Headwater Elevation:	1972.000	ft
Tailwater Elevation:	0.000	ft
Downstream Velocity:	8.96	ft/s
Downstream Flow Depth:	0.723	ft
Critical Flow Depth:	1.064	ft
Normal Flow Depth:	0.723	ft
Flow Control Type:	Outlet Control, Gradually Varied Flow	

SP-1 DEWATERING

Elevation	Storage (cf)	Discharge (cfs)	Time (hr)	# of Openings	Orifice Size (in)
1963.5	131304	0.00	0	4	1.5
1964.0	150836	0.17	32.46		
1964.5	171390	0.24	24.16	4	1.5
1965.0	192974	0.46	13.13		
1965.5	215598	0.57	11.01	4	1.5
1966.0	239271	0.83	7.92		
1966.5	264001	0.98	7.01	4	1.5
1967.0	289799	1.27	5.63		
1967.5	316671	1.45	5.14	4	1.5
1968.0	344629	1.77	4.38		
1968.5	373680	1.98	4.07		
1969.0	403834	2.16	3.88		
1969.5	435099	2.32	3.74		
1970.0	467486	2.47	3.64		

Total	**126.16**	**hours**
	5.26	**days**

Summary for Subcatchment 2S: SP-1 AREA

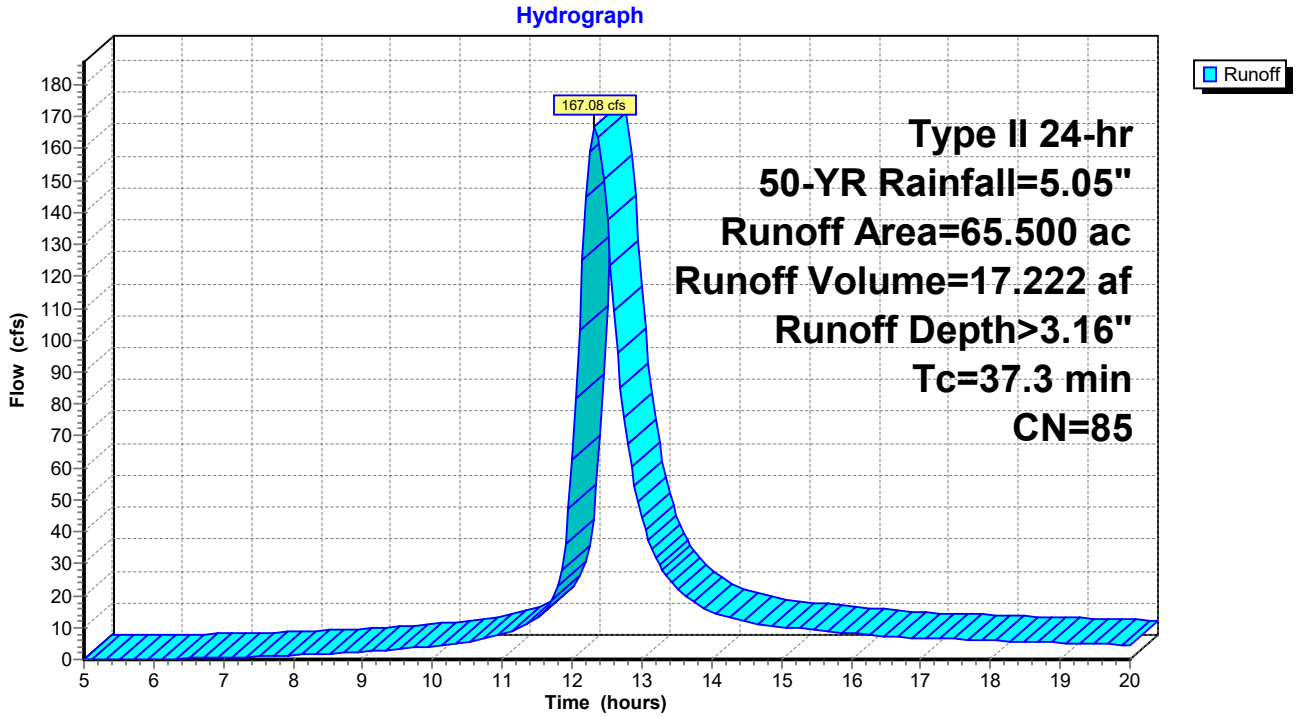
Runoff = 167.08 cfs @ 12.32 hrs, Volume= 17.222 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-YR Rainfall=5.05"

	Area (ac)	CN	Description
*	65.500	85	
	65.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3					**Direct Entry,**

Subcatchment 2S: SP-1 AREA



Summary for Pond 5P: SP-1

Inflow Area = 65.500 ac, 0.00% Impervious, Inflow Depth > 3.16" for 50-YR event
Inflow = 167.08 cfs @ 12.32 hrs, Volume= 17.222 af
Outflow = 156.79 cfs @ 12.42 hrs, Volume= 17.100 af, Atten= 6%, Lag= 6.0 min
Secondary = 156.79 cfs @ 12.42 hrs, Volume= 17.100 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 1,971.00' Surf.Area= 0 sf Storage= 535,656 cf
Peak Elev= 1,972.00' @ 12.42 hrs Surf.Area= 0 sf Storage= 608,089 cf (72,433 cf above start)
Flood Elev= 1,972.00' Surf.Area= 0 sf Storage= 608,418 cf (72,762 cf above start)

Plug-Flow detention time= 269.9 min calculated for 4.803 af (28% of inflow)
Center-of-Mass det. time= 9.5 min (801.5 - 792.0)

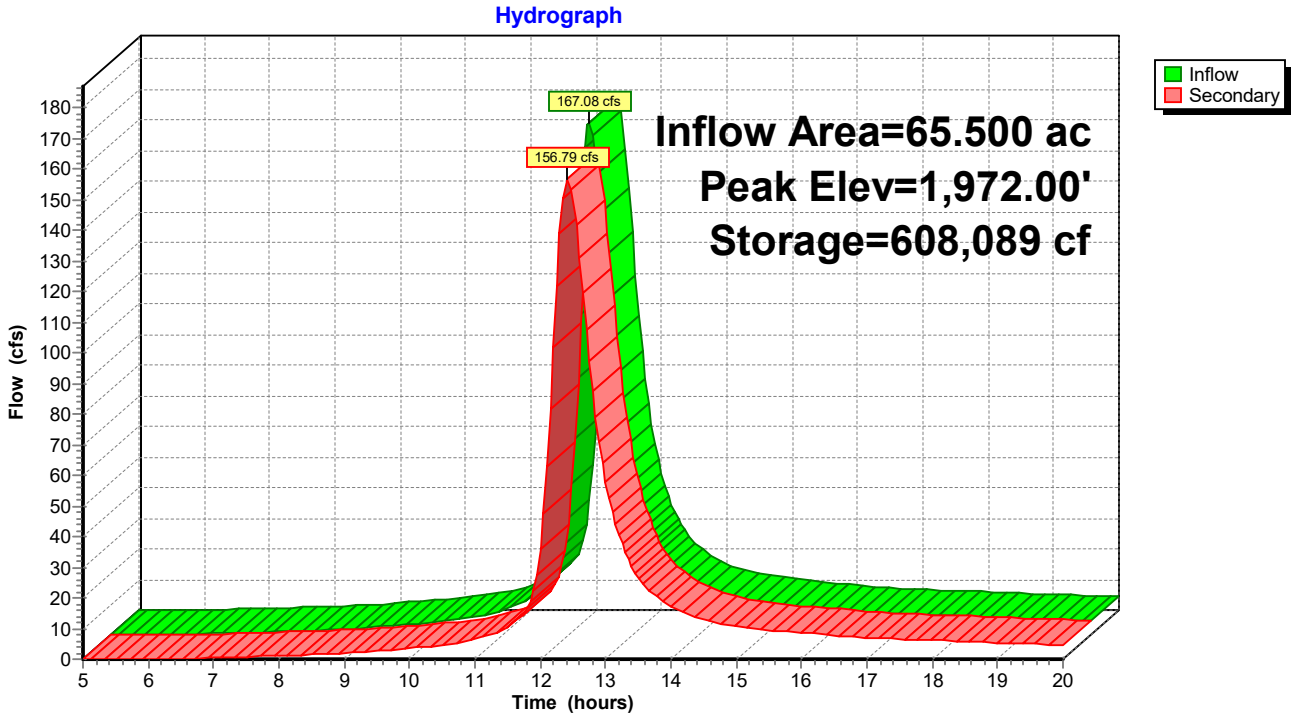
Volume	Invert	Avail.Storage	Storage Description
#1	1,959.00'	768,002 cf	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (cubic-feet)
1,959.00	0
1,959.50	10,743
1,960.00	22,426
1,960.50	35,060
1,961.00	48,651
1,961.50	63,211
1,962.00	78,746
1,962.50	95,268
1,963.00	112,784
1,963.50	131,304
1,964.00	150,836
1,964.50	171,390
1,965.00	192,974
1,965.50	215,598
1,966.00	239,271
1,966.50	264,001
1,967.00	289,799
1,967.50	316,671
1,968.00	344,629
1,968.50	373,680
1,969.00	403,834
1,969.50	435,099
1,970.00	467,486
1,970.50	501,001
1,971.00	535,656
1,971.50	571,459
1,972.00	608,418
1,972.50	646,543
1,973.00	685,842
1,973.50	726,326
1,974.00	768,002

Device	Routing	Invert	Outlet Devices
#1	Secondary	1,971.00'	**60.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Secondary OutFlow Max=156.03 cfs @ 12.42 hrs HW=1,971.99' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 156.03 cfs @ 2.62 fps)

Pond 5P: SP-1



Summary for Subcatchment 2S: SP-1 AREA

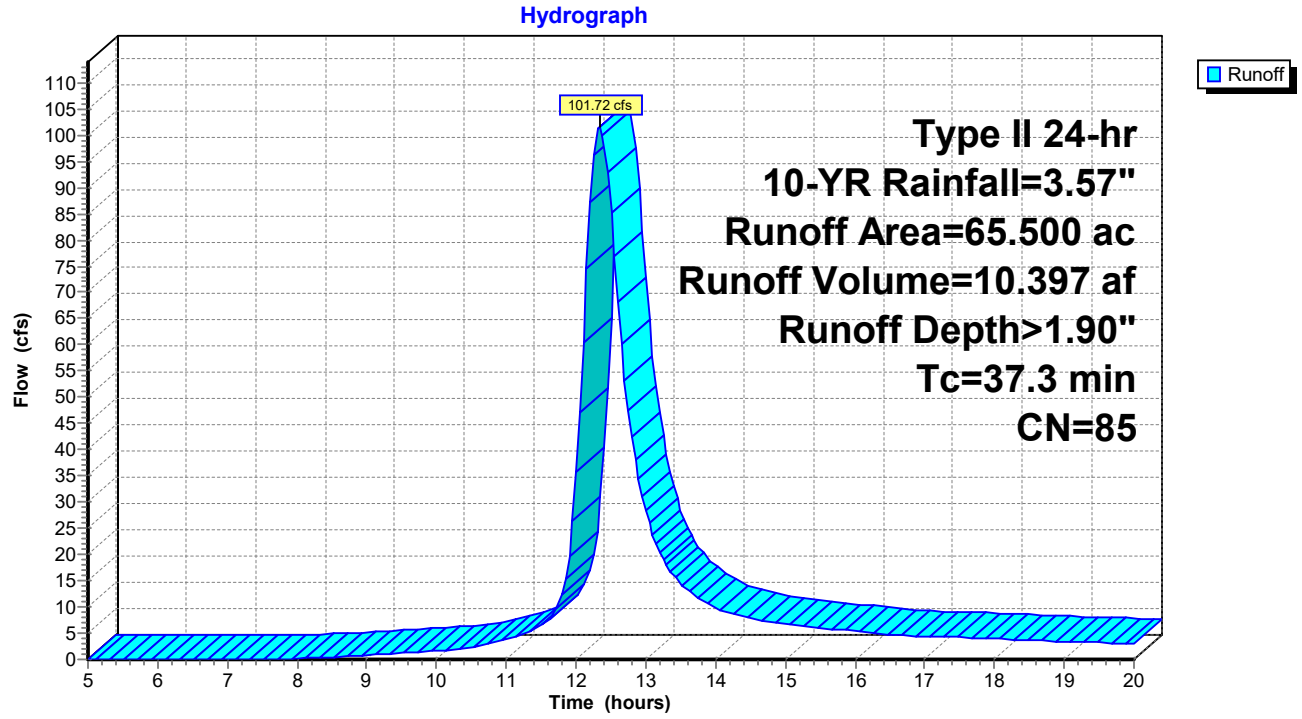
Runoff = 101.72 cfs @ 12.33 hrs, Volume= 10.397 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

	Area (ac)	CN	Description
*	65.500	85	
	65.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3					**Direct Entry,**

Subcatchment 2S: SP-1 AREA



Summary for Pond 1P: SP-1

Inflow Area = 65.500 ac, 0.00% Impervious, Inflow Depth > 1.90" for 10-YR event
Inflow = 101.72 cfs @ 12.33 hrs, Volume= 10.397 af
Outflow = 3.24 cfs @ 19.41 hrs, Volume= 1.160 af, Atten= 97%, Lag= 424.7 min
Primary = 3.24 cfs @ 19.41 hrs, Volume= 1.160 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 1,963.50' Surf.Area= 0 sf Storage= 131,304 cf
Peak Elev= 1,970.98' @ 19.41 hrs Surf.Area= 0 sf Storage= 533,994 cf (402,690 cf above start)
Flood Elev= 1,972.00' Surf.Area= 0 sf Storage= 608,418 cf (477,114 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 258.5 min (1,061.6 - 803.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,959.00'	768,002 cf	**Custom Stage Data** Listed below

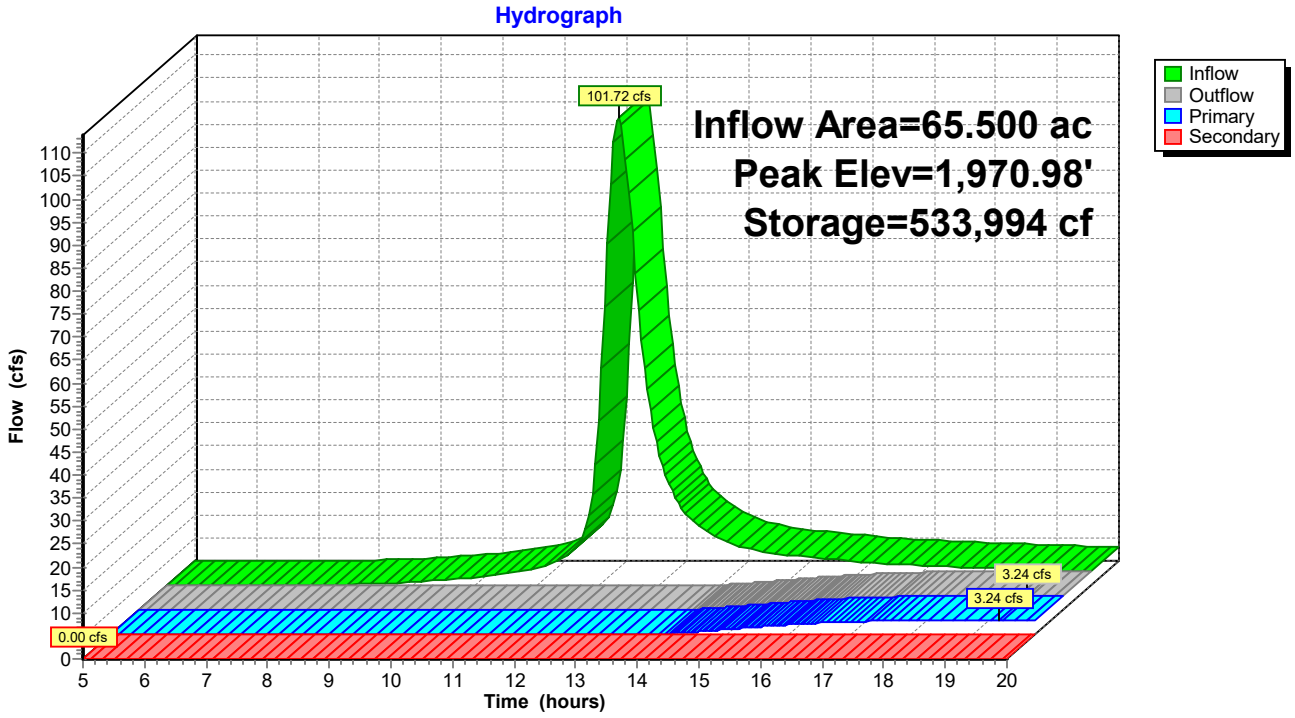
Elevation (feet)	Cum.Store (cubic-feet)
1,959.00	0
1,959.50	10,743
1,960.00	22,426
1,960.50	35,060
1,961.00	48,651
1,961.50	63,211
1,962.00	78,746
1,962.50	95,268
1,963.00	112,784
1,963.50	131,304
1,964.00	150,836
1,964.50	171,390
1,965.00	192,974
1,965.50	215,598
1,966.00	239,271
1,966.50	264,001
1,967.00	289,799
1,967.50	316,671
1,968.00	344,629
1,968.50	373,680
1,969.00	403,834
1,969.50	435,099
1,970.00	467,486
1,970.50	501,001
1,971.00	535,656
1,971.50	571,459
1,972.00	608,418
1,972.50	646,543
1,973.00	685,842
1,973.50	726,326
1,974.00	768,002

Device	Routing	Invert	Outlet Devices
#1	Primary	1,970.00'	**18.0" Round Culvert** L= 40.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,970.00' / 1,969.20' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Secondary	1,971.00'	**60.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.23 cfs @ 19.41 hrs HW=1,970.98' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.23 cfs @ 2.66 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,963.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: SP-1



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

E-TEMPLATE
SEDIMENT POND CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: SP-2 NPDES Outfall ID #: 002

Location (point of discharge): Latitude (DMS): 39° 54' 14" Longitude (DMS): 79° 09' 17"

Drainage Area: 81.7 acres Design Storm: 50 year / 24 hour Rainfall Amount: 5.05 inches

Average Watershed Slope: 6% Land Use: Quarry Soil Type: C Curve Number: 85

Peak Discharge: 231.2 cubic feet/second NPDES Average Flow: 0.80 mgd NPDES Design Flow: 190.6 mgd

		Permit Application	***As Constructed***
Embankment	Top Width (Minimum)	10'	
	Outside Slope (Maximum) (H:V)	3h:1v	
	Inside Slope (Maximum) (H:V)	3h:1v	
	Top Elevation	2010.0	
	Bottom Elevation	1995.0	
	Upstream Toe Elevation	1995.0	
	Downstream Toe Elevation	1984.0	
	Type of Cover	Vegetation	
	Incised Slope (if any)		
	Inside Slope (Maximum) (H:V)	0.25h:1v(virgin rock only)	
	Top Elevation		
	Bottom Elevation		
Principal Spillway	Type	Barrel	
	Conduit Diameter (if barrel/riser give both)	(2x) 18"	
	Inlet Elevation	2006.0	
	Outlet Protection	R-4 Rip-Rap	
	Spillway Capacity (cubic feet/second)	15.1 cfs	
Dewatering Device	Type/Size	6" Perf PVC w/capped top	
	Inlet Elevation	1999.5	
	Discharge Regulation (self-draining or valved)	Valved	
	Discharge Capacity (cubic feet/second)	2.47 cfs	
	Time to Dewater Full Pond	6.60 days	
Emergency Spillway	Type	Trapezoidal Weir	
	Width	76'	
	Depth (with 2 feet of freeboard)	3.1'	
	Length	50' (28.6' Control)	
	Sideslopes (H:V)	2h:1v	
	Crest Elevation	2006.9	
	Slope	2%	
	Type of Lining/Protection	R-4 Rip-Rap	
	Spillway Capacity (provide design calculations)	294.9 cfs	
Storage Capacity	Length @ Bottom	481' (average)	
	Width @ Bottom	69' (average)	
	Length @ Dewatering Device	508' (average)	
	Width @ Dewatering Device	96' (average)	
	Volume @ Dewatering Device	186,815 cf	
	Length @ Principal Spillway	547' (average)	
	Width @ Principal Spillway	135' (average)	
	Volume @ Principal Spillway	595,541 cf	
	Length @ Crest of Emergency Spillway	552.4' (average)	
	Width @ Crest of Emergency Spillway	140.4' (average)	
	Volume @ Crest of Emergency Spillway	666,203 cf	

Will the sediment pond be constructed in previously disturbed, fractured, or unconsolidated material? ☐ Yes ☒ No

If yes, specify the type of liner that will be used: _____

SEDIMENT POND CONSTRUCTION CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: SP-2 NPDES Outfall ID #: 002

1.	Has the facility been constructed at the location shown in the approved permit?	☐ Yes	☐ No	
2.	Is the emergency spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	
3.	Is the principal spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	☐ NA
4.	Is the dewatering device constructed at the location shown in the approved plan?	☐ Yes	☐ No	
5.	Are the collection channel inlets constructed at the location shown in the approved plan?	☐ Yes	☐ No	
6.	Do the collection channel inlets have adequate inlet protection?	☐ Yes	☐ No	
7.	Has the liner been installed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
8.	Has the non-discharge alternative been constructed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
9.	Was coal encountered during construction of the pond?	☐ Yes	☐ No	
10.	If yes, was a liner used?	☐ Yes	☐ No	
11.	Identify any conditions or deficiencies in the facility that need to be corrected.			☐ NA

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation, non-discharge alternative construction)	Date of Inspection	Inspected By

Supervising Professional Engineer/Registered Professional Land Surveyor _____

Address and phone _____

I certify in accordance with 25 Pa Code Section 77.531, 87.112, 89.101, or 90.112 that the above-mentioned structure is complete and has been constructed.

_____
Signature of Registered Professional Engineer/Registered Professional Land Surveyor Date

SEAL

_____
Registration Number and Expiration Date

_____ _____
Signature of Permittee or Responsible Official Date Title

SP-2 Report

Top of dam elevation: 2010.0000
Bottom of pond elevation: 1995.0000
Top of dam width: 10.0000
Cut Slope: 50.00% 2.000:1 26.57°
Fill Slope: 33.33% 3.000:1 18.43°
Interior Slope: 33.33% 3.000:1 18.43°
Existing Surface: Z:\Mining\Rockwood Stone, LLC\Dwgs&Data\TIN Files\2020 PASDA.tin

Pond Earthwork Volumes
Total cut : 1,226,106.66 C.F., 45,411.36 C.Y.
Total fill: 363,147.75 C.F., 13,449.92 C.Y.

Pond Storage Volumes

Water Elev	Storage(AcreFt)	(C.Y.)	(C.F.)	(Gallons)	Area(Acre)
1995.00	0.00000	0.0	0.0	0.0	0.768
1995.50	0.39369	635.1	17149.0	128283.4	0.807
1996.00	0.80755	1302.9	35177.0	263142.1	0.848
1996.50	1.24182	2003.5	54093.8	404650.0	0.889
1997.00	1.69673	2737.4	73909.4	552881.0	0.931
1997.50	2.17249	3505.0	94633.7	707909.1	0.973
1998.00	2.66934	4306.5	116276.4	869808.1	1.015
1998.50	3.18750	5142.5	138847.6	1038652.0	1.058
1999.00	3.72720	6013.2	162357.0	1214514.6	1.101
1999.50	4.28867	6919.1	186814.6	1397470.0	1.145
2000.00	4.87213	7860.4	212230.2	1587591.9	1.189
2000.50	5.47782	8837.5	238613.7	1784954.4	1.234
2001.00	6.10595	9850.9	265975.0	1989631.4	1.279
2001.50	6.75675	10900.9	294324.0	2201696.7	1.324
2002.00	7.43045	11987.8	323670.6	2421224.3	1.370
2002.50	8.12729	13112.0	354024.6	2648288.0	1.417
2003.00	8.84747	14273.9	385396.0	2882961.9	1.464
2003.50	9.59124	15473.9	417794.5	3125319.8	1.511
2004.00	10.35882	16712.2	451230.1	3375435.6	1.559
2004.50	11.15043	17989.4	485712.7	3633383.3	1.607
2005.00	11.96630	19305.6	521252.2	3899236.8	1.656
2005.50	12.80666	20661.4	557858.3	4173069.9	1.705
2006.00	13.67174	22057.1	595541.1	4454956.6	1.755
2006.50	14.56176	23493.0	634310.4	4744970.9	1.805
2007.00	15.47695	24969.5	674176.0	5043186.6	1.856
2007.50	16.41754	26487.0	715147.9	5349677.6	1.907
2008.00	17.38374	28045.8	757235.9	5664517.9	1.958
2008.50	18.37580	29646.3	800450.0	5987781.4	2.010
2009.00	19.39394	31288.9	844799.9	6319541.9	2.062
2009.50	20.43838	32973.9	890295.6	6659873.5	2.115
2010.00	21.50934	34701.7	936947.0	7008850.0	2.169

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

E-TEMPLATE
SEDIMENT POND CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: Process Pond 1 NPDES Outfall ID #: N/A

Location (point of discharge): Latitude (DMS): 39° 54' 32"(non-discharge) Longitude (DMS): 79° 09' 18"

Drainage Area: 0 acres Design Storm: N/A year / 24 hour Rainfall Amount: N/A inches

Average Watershed Slope: N/A Land Use: Quarry Soil Type: C Curve Number: 85

Peak Discharge: 0 cubic feet/second NPDES Average Flow: 0 mgd NPDES Design Flow: 0 mgd

		Permit Application	***As Constructed***
Embankment	Top Width (Minimum)	25'	
	Outside Slope (Maximum) (H:V)	2.5h:1v	
	Inside Slope (Maximum) (H:V)	2h:1v	
	Top Elevation	2030.0	
	Bottom Elevation	2020.0	
	Upstream Toe Elevation	2020.0	
	Downstream Toe Elevation	2008.0	
	Type of Cover	Vegetation or Rock-Lined	
	Incised Slope (if any)		
	Inside Slope (Maximum) (H:V)	0.25h:1v(virgin rock only)	
	Top Elevation		
	Bottom Elevation		
Principal Spillway	Type	Barrel	
	Conduit Diameter (if barrel/riser give both)	12"	
	Inlet Elevation	2027.0	
	Outlet Protection	R-4 Rip-Rap	
	Spillway Capacity (cubic feet/second)	1.75 cfs	
Dewatering Device	Type/Size	N/A	
	Inlet Elevation	N/A	
	Discharge Regulation (self-draining or valved)	N/A	
	Discharge Capacity (cubic feet/second)	N/A	
	Time to Dewater Full Pond	N/A	
Emergency Spillway	Type	N/A	
	Width	N/A	
	Depth (with 2 feet of freeboard)	N/A	
	Length	N/A	
	Sideslopes (H:V)	N/A	
	Crest Elevation	N/A	
	Slope	N/A	
	Type of Lining/Protection	N/A	
	Spillway Capacity (provide design calculations)	N/A	
Storage Capacity	Length @ Bottom	275'	
	Width @ Bottom	10'	
	Length @ Dewatering Device	N/A	
	Width @ Dewatering Device	N/A	
	Volume @ Dewatering Device	N/A	
	Length @ Principal Spillway	303'	
	Width @ Principal Spillway	38'	
	Volume @ Principal Spillway	49,009 cf	
	Length @ Crest of Emergency Spillway	N/A	
	Width @ Crest of Emergency Spillway	N/A	
	Volume @ Crest of Emergency Spillway	N/A	

Will the sediment pond be constructed in previously disturbed, fractured, or unconsolidated material? ☒ Yes ☐ No

If yes, specify the type of liner that will be used: Best available on-site clay or synthetic

SEDIMENT POND CONSTRUCTION CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: Process Pond 1 NPDES Outfall ID #: N/A

1.	Has the facility been constructed at the location shown in the approved permit?	☐ Yes	☐ No	
2.	Is the emergency spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	
3.	Is the principal spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	☐ NA
4.	Is the dewatering device constructed at the location shown in the approved plan?	☐ Yes	☐ No	
5.	Are the collection channel inlets constructed at the location shown in the approved plan?	☐ Yes	☐ No	
6.	Do the collection channel inlets have adequate inlet protection?	☐ Yes	☐ No	
7.	Has the liner been installed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
8.	Has the non-discharge alternative been constructed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
9.	Was coal encountered during construction of the pond?	☐ Yes	☐ No	
10.	If yes, was a liner used?	☐ Yes	☐ No	
11.	Identify any conditions or deficiencies in the facility that need to be corrected.			☐ NA

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation, non-discharge alternative construction)	**Date of Inspection**	**Inspected By**

Supervising Professional Engineer/Registered Professional Land Surveyor

Address and phone

I certify in accordance with 25 Pa Code Section 77.531, 87.112, 89.101, or 90.112 that the above-mentioned structure is complete and has been constructed.

Signature of Registered Professional Engineer/Registered Professional Land Surveyor Date

SEAL

Registration Number and Expiration Date

Signature of Permittee or Responsible Official Date Title

Process Pond 1 Stage-Storage Report Fri May 30 11:24:55 2025

File: Z:\Mining\Rockwood Stone, LLC\LNC Application\Modules 9-14\Ponds\PROCESS PONDS\PROCESS PONDS.cap

Elev(Ft)	Storage(CF)	Area(SF)
2020.000	0.0	2750.000
2020.500	1518.2	3324.000
2021.000	3325.3	3906.000
2021.500	5425.5	4496.000
2022.000	7822.7	5094.000
2022.500	10520.8	5700.000
2023.000	13524.0	6314.000
2023.500	16836.2	6936.000
2024.000	20461.3	7566.000
2024.500	24403.5	8204.000
2025.000	28666.7	8850.000
2025.500	33254.8	9504.000
2026.000	38172.0	10166.000
2026.500	43422.2	10836.000
2027.000	49009.3	11514.000
2027.500	54937.5	12200.000
2028.000	61210.7	12894.000
2028.500	67832.8	13596.000
2029.000	74808.0	14306.000
2029.500	82140.2	15024.000
2030.000	89833.3	15750.000

Process Pond 1 Outlet Design Fri May 30 11:33:52 2025

Design Parameters

Section		
Shape:	Circular	
Material:	HDPE	
Diameter:	12.00	in
Manning's n:	0.0120	
Number of Barrels:	1	
Inlet		
Inlet Type:	Thin Edge Projecting	
Ke:	0.90	
Inverts		
Inlet Invert Elevation:	2027.000	ft
Outlet Invert Elevation:	2026.520	ft
Length:	24.000	ft
Slope:	2.00	%

Culvert Calculation

Discharge:	1.75	cfs
Headwater Elevation:	2028.000	ft
Tailwater Elevation:	0.000	ft
Downstream Velocity:	6.19	ft/s
Downstream Flow Depth:	0.390	ft
Critical Flow Depth:	0.563	ft
Normal Flow Depth:	0.390	ft
Flow Control Type:	Outlet Control, Gradually Varied Flow	

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

E-TEMPLATE
SEDIMENT POND CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: Process Pond 2 NPDES Outfall ID #: N/A

Location (point of discharge): Latitude (DMS): 39° 54' 29"(non-discharge) Longitude (DMS): 79° 09' 20"

Drainage Area: 0 acres Design Storm: N/A year / 24 hour Rainfall Amount: N/A inches

Average Watershed Slope: N/A Land Use: Quarry Soil Type: C Curve Number: 85

Peak Discharge: 0 cubic feet/second NPDES Average Flow: 0 mgd NPDES Design Flow: 0 mgd

		Permit Application	***As Constructed***
Embankment	Top Width (Minimum)	25'	
	Outside Slope (Maximum) (H:V)	2.5h:1v	
	Inside Slope (Maximum) (H:V)	2h:1v	
	Top Elevation	2030.0	
	Bottom Elevation	2020.0	
	Upstream Toe Elevation	2020.0	
	Downstream Toe Elevation	2000.0	
	Type of Cover	Vegetation or Rock-Lined	
	Incised Slope (if any)		
	Inside Slope (Maximum) (H:V)	0.25h:1v(virgin rock only)	
	Top Elevation		
	Bottom Elevation		
Principal Spillway	Type	Pump	
	Conduit Diameter (if barrel/riser give both)	6"	
	Inlet Elevation	2027.0	
	Outlet Protection	N/A	
	Spillway Capacity (cubic feet/second)	1.45 cfs	
Dewatering Device	Type/Size	N/A	
	Inlet Elevation	N/A	
	Discharge Regulation (self-draining or valved)	N/A	
	Discharge Capacity (cubic feet/second)	N/A	
	Time to Dewater Full Pond	N/A	
Emergency Spillway	Type	N/A	
	Width	N/A	
	Depth (with 2 feet of freeboard)	N/A	
	Length	N/A	
	Sideslopes (H:V)	N/A	
	Crest Elevation	N/A	
	Slope	N/A	
	Type of Lining/Protection	N/A	
	Spillway Capacity (provide design calculations)	N/A	
Storage Capacity	Length @ Bottom	275'	
	Width @ Bottom	10'	
	Length @ Dewatering Device	N/A	
	Width @ Dewatering Device	N/A	
	Volume @ Dewatering Device	N/A	
	Length @ Principal Spillway	303'	
	Width @ Principal Spillway	38'	
	Volume @ Principal Spillway	49,009 cf	
	Length @ Crest of Emergency Spillway	N/A	
	Width @ Crest of Emergency Spillway	N/A	
	Volume @ Crest of Emergency Spillway	N/A	

Will the sediment pond be constructed in previously disturbed, fractured, or unconsolidated material? ☐ Yes ☒ No

If yes, specify the type of liner that will be used: _____

SEDIMENT POND CONSTRUCTION CERTIFICATION

Permittee: Rockwood Stone, LLC Site Name: Rockwood Quarry SMP No.: 56250301

Engineer/Land Surveyor: Earthtech, Inc. Structure ID #: Process Pond 2 NPDES Outfall ID #: N/A

1.	Has the facility been constructed at the location shown in the approved permit?	☐ Yes	☐ No	
2.	Is the emergency spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	
3.	Is the principal spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	☐ NA
4.	Is the dewatering device constructed at the location shown in the approved plan?	☐ Yes	☐ No	
5.	Are the collection channel inlets constructed at the location shown in the approved plan?	☐ Yes	☐ No	
6.	Do the collection channel inlets have adequate inlet protection?	☐ Yes	☐ No	
7.	Has the liner been installed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
8.	Has the non-discharge alternative been constructed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
9.	Was coal encountered during construction of the pond?	☐ Yes	☐ No	
10.	If yes, was a liner used?	☐ Yes	☐ No	
11.	Identify any conditions or deficiencies in the facility that need to be corrected.			☐ NA

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation, non-discharge alternative construction)	Date of Inspection	Inspected By

Supervising Professional Engineer/Registered Professional Land Surveyor _____

Address and phone _____

I certify in accordance with 25 Pa Code Section 77.531, 87.112, 89.101, or 90.112 that the above-mentioned structure is complete and has been constructed.

_____
Signature of Registered Professional Engineer/Registered Professional Land Surveyor Date

SEAL

_____
Registration Number and Expiration Date

_____ _____
Signature of Permittee or Responsible Official Date Title

Process Pond 2 Stage-Storage Report Fri May 30 11:24:55 2025

File: Z:\Mining\Rockwood Stone, LLC\LNC Application\Modules 9-14\Ponds\PROCESS PONDS\PROCESS PONDS.cap

Elev(Ft)	Storage(CF)	Area(SF)
2020.000	0.0	2750.000
2020.500	1518.2	3324.000
2021.000	3325.3	3906.000
2021.500	5425.5	4496.000
2022.000	7822.7	5094.000
2022.500	10520.8	5700.000
2023.000	13524.0	6314.000
2023.500	16836.2	6936.000
2024.000	20461.3	7566.000
2024.500	24403.5	8204.000
2025.000	28666.7	8850.000
2025.500	33254.8	9504.000
2026.000	38172.0	10166.000
2026.500	43422.2	10836.000
2027.000	49009.3	11514.000
2027.500	54937.5	12200.000
2028.000	61210.7	12894.000
2028.500	67832.8	13596.000
2029.000	74808.0	14306.000
2029.500	82140.2	15024.000
2030.000	89833.3	15750.000

See attached Exhibit 14.1a and 14.1b for the X-X' and Y-Y' stream profiles. The stream bed is rocky and alternates between stretches of steep riffles and shallow pools. The riparian vegetation is characterized by coniferous forest with little undergrowth. Stream data was gathered using the Stream Stats database and is included in the attached report. Rhoades Creek has a 50-year recurrence interval base flow of 2.13 cfs, or 956 gpm. This volume will be used as the average daily stream flow to provide a conservative analysis of stream characteristics. Based on the relatively small size and efficiency of the proposed processing facility, it is anticipated that only 85 GPM would be needed to supplement the wash plant system. Assuming 8 hours per day and 5 days per week, this would equate to an estimated maximum daily withdrawal of 40,800 gallons and an average monthly withdrawal of 816,000 gallons. The actual pumping rate from the withdrawal facility may vary from the usage rate. However, the overall total water withdrawn is estimated to reflect the numbers above. The proposed periodic pumping rate is 500 gpm (1.11 cfs). For a pass-by flow equivalent to 20% of the average daily stream flow the stream must have a flow of 0.43 cfs. With a withdrawal rate of 500 gpm a pass-by flow of 1.02 cfs can be achieved, which greatly exceeds pass-by flow requirements. The proposed withdrawal rate is based on a consideration of mining needs, and allows for sufficient pass-by flow for resident aquatic community needs. To acquire an adequate water supply for mining needs, pumping may be increased, however a sufficient pass-by flow will be maintained during pumping. A survey of the cross-section and profile of the stream channel in Rhoades Creek at the withdrawal location will be performed prior to the installation of the water withdrawal equipment. This will allow for a minimum flow depth to be calculated to allow pumping activities. A staff gauge and the pump intake will then be set at the appropriate elevation with a visual indicator to show when stream conditions allow for pumping, while maintaining the minimum passthrough flow of 0.43 cfs during pumping activities. The detailed stream cross-section and profiles, along with flow calculations, can be submitted to the Department prior to implementing water withdrawal from Rhoades Creek. No pumping will be performed if stream conditions are lower than 1.54 cfs, thus maintaining a pass-by flow of 0.43 and withdrawal rate of 500 gpm. It is noted that the Q 7-10 flow value is approximately 33 gpm, as is indicated in the attached Stream Stats report. A pump mounted on a trailer or similar type will be used to retrieve water. An example brochure of the type of trailer which may be used is attached.

It is believed that pumping the proposed volume from the stream will not negatively impact resident aquatic species. By implementing the proposed pass-by flow plan, a sufficient volume of water will be available for downstream aquatic species. It is noted that it is a short distance from the Rhoades Creek withdrawal to its confluence with the Casselman River. The Rhoades Creek banks become steeply incised which concentrates water flow. There are no known water intake structures in the downstream length prior to the confluence with the Casselman River. The pass-by staff gauge must be surveyed and properly calibrated to ensure accurate readings prior to commencing water withdrawal operations. This information was prepared by Earthtech, Somerset office, 966 Pleasant Hill Road.

d) A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions;

See Exhibit 14.1a and 14.1b for stream profiles, bed slopes, pool-riffle ratios, and normal and flood water surfaces. There are no proposed changes to the stream bed or banks. There are no existing man-made obstructions. Some large cobbles/boulders are present in the stream channel.

e) A hydrologic and hydraulic analysis which shall include:
1. data on size, shape, and characteristics of the watershed;
2. the size and frequency of the design storm;
3. the hydraulic capacity of any structures or replacement channel;
4. the hydraulic capacity of the channel upstream and downstream of the structure or the relocation/channel change;

The attached Stream Stats report for Rhoades Creek was used for watershed data. The drainage area for Rhoades Creek is 4.6 square miles and consists of an approximately even balance of cropland and forestland. Based on visual estimations using Google Earth Imagery, the forest is approximately 70% deciduous and 30% coniferous within the drainage area, and nearly 100% coniferous in the vicinity of the proposed installation. This project was designed to avoid impacts to FEMA delineated 100-year floodplains. See the attached National Flood Hazard Layer FIRMette for information on the floodplains. The water-pump trailer will be portable via pick-up truck and easily removed from the staging pad in case of a flood event. The suction hose can be handled by one man and can be removed during high flow or freezing conditions.